EFFECT OF TRANSPORT/BOMBER LOADS SPECTRUM ON CRACK GROWTH

Douglas Aircraft Company McDonnell Douglas Corporation 3855 Lakewood Boulevard Long Beach, CA 90846

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JAMES J. OLSEN, Acting Chief Structural Integrity Branch

FOR THE COMMANDER

RALPH L. KUSTER, JR., Col, USAF

Chief, Structures & Dynamics Division

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| | This program investigated analytically and e | xperimentally the effect | of transport/bomber loads spectrum | |
| | variations on crack growth. The spectrum re | epresented a STOL trans | port (C-15) wing lower surface loading. | |
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| | | | | |
| | (7) design stress level, (8) valley/peak coupli | ng, (9) low load truncati | ion, (10) high infrequent loads, (11) | |
| | | | | |
| | random cycle-by-cycle, flight-by-flight seque | ences. Analyses and tests | s were performed on 7475-T7651 | |

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| aluminum, t = 0.25 inches, starting with an initial through-the-thickness 0.03-inch crack out of a 1/4-inch diameter hole. Crack growth analysis predictions were made for all 116 spectra using the linear model. Crack growth tests were performed with 33 of these spectra. Good correlation was obtained between analysis and test results in all cases except with spectra dealing with increased frequency and magnitude of high infrequent loads and spectra which were drastically changed from a wing-type to a vertical tail-type spectrum. |
| Largest effects on crack growth life, as measured in flight hours, was due to flight length, mission, mission mix, and design stress level variations. Based on the results of this program, fleetwide crack growth variations by a factor of 100 and 10 could be experienced, depending on whether it was short-term or long-term variation. |
| In addition, tests were performed to check the effect of sustained compression loading and the effect of a fastener in the hole on crack growth. The sustained compression loading showed no effect. Installation of a neat-fit pin in the hole produced a very significant crack growth rate reduction. |
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FOREWORD

This report was prepared by Douglas Aircraft Company, Long Beach, California for the Structural Integrity Branch, Structural Mechanics Division, Air Force Flight Dynamics Laboratory, Wright-Patterson Air Force Base, Ohio. The report covers work accomplished under Contract F33615-76-C-3116, Project 486U "Advanced Metallic Structures," Work Unit 486U — "Effect of Transport/Bomber Spectrum on Crack Growth." The project technical monitor was Mr. J. M. Potter, AFFDL/FBE.

The work was performed in the Advanced Technology Section Fatigue and Fracture Mechanics Group of the Structures Engineering subdivision under the leadership of Messrs. T. Swift, D. Smillie and M. Stone. The program manager was Mr. J. Palmer. Mr. P. R. Abelkis was the program technical director. Testing was performed in the Structural Testing Laboratories by Messrs. E. G. Willoughby and J. M. Snyder under the leadership of Mr. A. M. Anderson. Computer programming and general support was provided by Ms. P. M. Lee and Mr. D. B. Anderson of the Structural Methods Group and G. Agajanian of McAuto Scientific Programming Group. Editor for the report was L. R. Gallaway. The author expresses his appreciation to all who contributed to the implementation and success of this program.

The computer program and the input data (on magnetic tape) used to generate the 116 spectra described in this report may be obtained directly from:

Air Force Flight Dynamics Laboratory/FBE Attn: J. M. Potter Wright-Patterson Air Force Base Ohio 45433

This report covers work accomplished during the period September 1976 through September 1978. The report was released by the author for publication in November 1978.

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SECTION 1

INTRODUCTION

Crack growth in aircraft structures varies as a function of material, loading spectrum and environment properties. Loading spectrum and environment properties vary as a function of aircraft type, aircraft usage, variability between the same type of aircraft within a fleet, and the type of structure. This study was primarily concerned with the effect of loading spectrum variability on crack growth.

The objectives of the program reported herein were to evaluate the effect of transport/bomber fatigue loads spectra variations on crack growth and to produce recommendations and guidelines for load spectrum development. The evaluation was performed analytically and experimentally. One other objective, somewhat apart from the main theme of the program, was to experimentally investigate the effect of sustained compression loading on crack growth. In addition, the program produced experimental data on the effect of a neat fit pin on the crack growth out of the hole as opposed to the crack growth out of an open hole.

To meet the above objectives, the program consisted of the generation and crack growth analysis of 116 spectra variations representing a transport wing lower surface; 33 of these spectra were tested. The effect of the sustained compression loading (SCL) was investigated through the testing of five specimen under a loading spectrum with and without SCL.

1.1 FATIGUE LOADING TERMINOLOGY

Following are the definitions of some of the more frequently used terms used in this report to describe fatigue loading:

Fatigue loading — periodic or nonperiodic fluctuating loading applied to a test specimen or experienced by a structure in service (also known as cyclic loading).

Constant amplitude loading — a fatigue loading in which all of the peak loads are equal and all of the valley loads are equal.

Spectrum loading — a fatigue loading in which all of the peak loads are not equal and/or all of the valley loads are not equal (also known as variable amplitude loading or irregular loading).

Exceedances spectrum — representation of spectrum loading contents in terms of the cumulative frequency of occurrence of such loading parameters as the peak load or load range for a given mean load or load ratio (also known as cumulative frequency spectrum).

Flight — the portion of aircraft usage from engine-on to engine-off; normally involves one landing, except that a training flight may involve more than one in the form of touch-and-go landings.

Peak — the point at which the first derivative of the load-time history changes from positive to negative sign, see Figure 1-1.

Valley — the point at which the first derivative of the load-time history changes from negative to positive sign, see Figure 1-1.

Range – the algebraic difference between successive valley and peak load, see Figure 1-1.

Reversal — the point at which the first derivative of the load-time history changes sign.

R – loading ratio: the valley load divided by the following peak load.

Cycle - the portion of loading history from a valley to the next peak to the next valley, see Figure 1-1.

 $GAG\ Cycle\ -\ Cycle\ representing$ the transition loading from the ground to in-air airplane configuration.

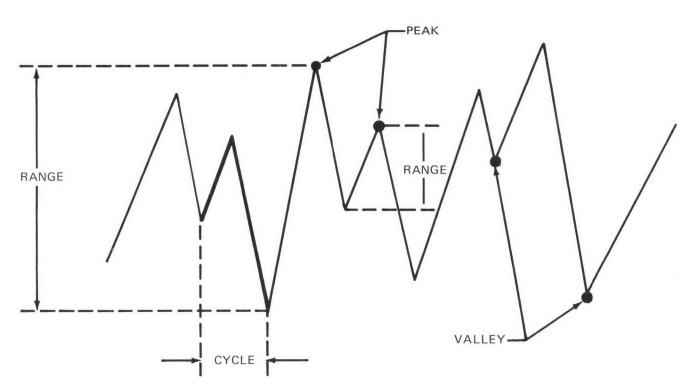


FIGURE 1-1. FATIGUE LOADING TERMS.

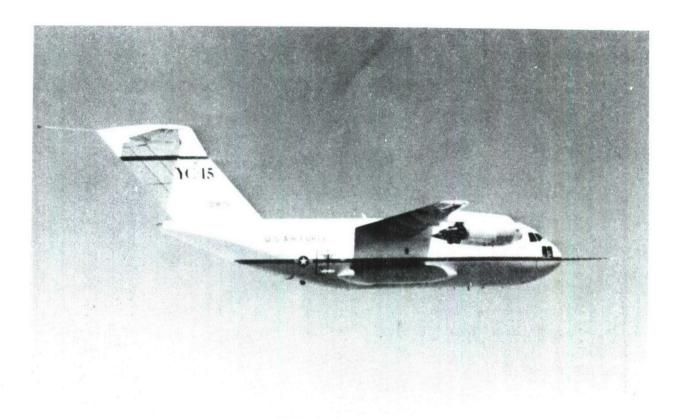
1.2 AIRPLANE, STRUCTURE, MATERIAL

The wing lower surface skin of the C-15, an advanced medium STOL transport (AMST), was chosen as the structure and airplane for this program. The stress spectra used throughout this program reflect this structure.

The YC-15, depicted in Figure 1-2, is a high-wing, T-tail, four-engine transport featuring wide fuselage and externally blown flaps for short takeoff and landing capability. The loading environment to which it is subjected (i.e., gusts, maneuvers, low-level high-speed penetration, normal and STOL takeoffs and landings and ground operation) encompasses all basic loading environments which are representative of various transport and bomber aircraft. Two prototypes of the airplane have been built and flight tested.

The C-15 wing, illustrated in Figure 1-3, is a typical skin-stringer wing structure. The area of the wing lower skin selected for this program is at the wing root because the highest ground compression stresses are produced here, whereas the flight tension stresses are fairly constant throughout the wing

The material selected for this program, 7475-T7651 aluminum alloy bare plate, t = 0.25 inch, was one of the two candidate materials considered for the C-15 wing lower skin at the inception of this program. Typical wing lower surface skin materials of current transport/bomber aircraft are given in Table 1-1. It is assumed that loading spectrum variation effects on crack growth would show similar trends for any of these materials.



PROTOTYPE IN FLIGHT

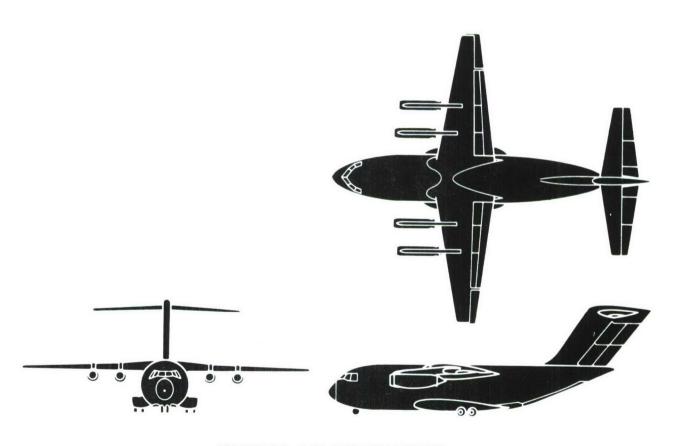


FIGURE 1-2. C-15 AMST TRANSPORT

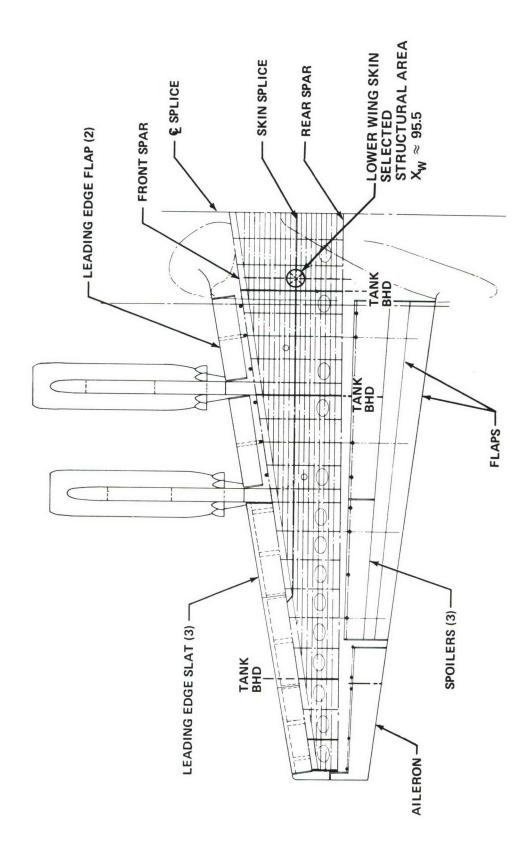


FIGURE 1-3. C-15 WING STRUCTURAL ARRANGEMENT

TABLE 1-1 LOWER WING SKIN MATERIALS FOR CURRENT TRANSPORT/BOMBER AIRCRAFT

| AIRCRAFT | WING LOWER SURFACE SKIN MATERIAL | | | | |
|--|--------------------------------------|--|--|--|--|
| YC-15 C-15 DC-10 DC-9 DC-8 L-1011 B747 B707 B727 B737 C-5 C-141 C-130 B1 | 7075-T76 | | | | |
| C-15 | 7475-T761 2024-T351 CANDIDATES | | | | |
| DC-10 | 2024-T351 | | | | |
| DC-9 | 2024-T 351 | | | | |
| DC-8 | 7075-T6 | | | | |
| L-1011 | 7075-T76 | | | | |
| B747 | 2024-T 351 | | | | |
| B707 | 2024-T351 | | | | |
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SECTION 2

LOADS SPECTRA DEVELOPMENT AND VARIATIONS

This section describes the loads spectra development procedures and the spectra variations produced for this program. Figure 2-1 outlines the general development procedures used in this effort: definition of aircraft utilization-mission profiles, establishment of load factor exceedances spectra, calculation of the load factor-stress transfer function for the selected structural element, and the generation and editing of the flight and cycle sequence.

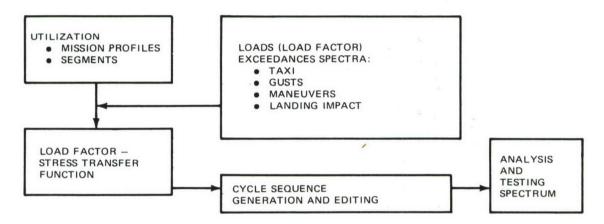


FIGURE 2-1. LOADS SPECTRUM DEVELOPMENT PROCEDURES

2.1 LOADS SPECTRA DEVELOPMENT BASIC INPUTS

The loads spectra development basic inputs consist of the utilization defined by the mission profiles and the associated parameters, the loads occurrences data in terms of aircraft cg load factor exceedances spectra, and the load factor-stress transfer function to convert the load factor spectrum into a stress spectrum

2.1.1 Utilization and Mission Profiles

The C-15 projected utilization, at the inception of this program, was defined by the five missions as given in Table 2-1. The mission profiles are illustrated in Figure 2-2 and are defined in detail in Appendix A. Missions 1, 3, and 4 consist of two flights each, while Missions 2 and 5 involve only one flight each. The term "flight" represents that portion of a mission ending with a full landing. However, a "flight" may have more than one landing if it involves touch-and-go (T and G) landings, such as in the case of flights 4A and 4B. The missions reflect the special features of this airplane, i.e., short takeoff and landing capability, as well as low-altitude penetration flying. Typical of transport and bomber aircraft, the eight flights represent a significant variation in

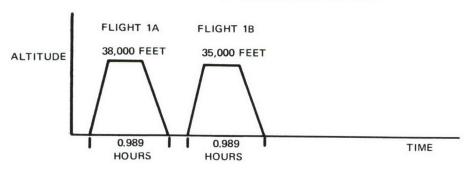
C-15 PROJECTED UTILIZATION TABLE 2-1

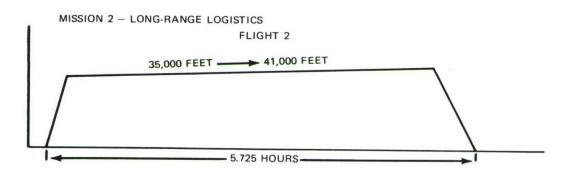
| | | | > 0 | | 7 | LANDINGS PER FLIGHT | R FLIGHT | | PEI | PERCENT OF TOTAL | TAL |
|-----|---|----------|---------|---------------------------|---------------------|---------------------|-----------------|----------|---------|------------------|----------|
| | MISSION | FLIGHT | LOAD. % | FLIGHT HOURS | FULL L | FULL LANDING | TOUCH AND GO(3) | ND GO(3) | | FLIGHT | |
| NO. | DESCRIPTION | NO. | (1) | PER FLIGHT ⁽²⁾ | CTOL ⁽⁴⁾ | STOL ⁽⁵⁾ | CTOL | STOL | FLIGHTS | HOURS | LANDINGS |
| - | BASIC AND ALTERNATE EMPLOYMENT | 1a 1b | 21.8 | 0.989 | 1 - | | 1 1 | 1 1 | 11.35 | 10.88 | 7.16 |
| 2 | LONG RANGE LOGISTICS | 2 | 20 | 5.725 | - | 1 | Ī | 1 | 6.36 | 35.31 | 4.01 |
| т | LOW ALTITUDE RESUPPLY ⁽⁶⁾ | 3a 3b | 43.5 | 0.489 | | - 1 | 1 1 | 1 1 | 15.47 | 7.34 | 9.76 |
| 4 | BASIC TRAINING | 4a 4b | 21.8 | 0.965 | 1 - | | 1 - | 9 | 8.86 | 8.28 | 39.10 |
| 2 | COMBAT TRAINING ⁽⁶⁾ | 2 | 21.8 | 0.78 | - | 1 | 1 | 1 | 12.30 | 9.29 | 7.75 |

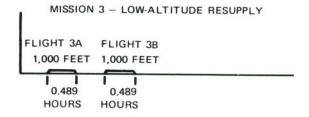
(1) (2) (3) (5) (6)

PERCENT OF MAXIMUM PAYLOAD
FLIGHT TIME ONLY
TOUCH AND GO LANDINGS
CONVENTIONAL TAKEOFF OR LANDING
SHORT TAKEOFF OR LANDING
INCLUDES LOW-ALTITUDE PENETRATION FLYING

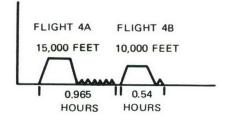
MISSION 1 - BASIC AND ALTERNATE EMPLOYMENT







MISSION 4 - BASIC TRAINING



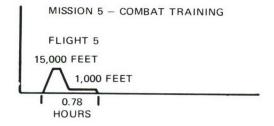


FIGURE 2-2. MISSION PROFILES

payload, ranging from 21.8 to 100 percent of the maximum design payload, with an overall average of 48 percent. Some other general features of the utilization are:

- Average number of flight hours/flight = 0.97.
- Average number of flight hours/landing (including touch-and-go landings) = 0.65.
- 36.9 percent of all landings are touch and go.
- 20.5 percent of total flight time is in low-altitude penetration.
- Short takeoffs and landings are considered to be made from semiprepared runways.

2.1.2 Loads Exceedances Spectra

The loads exceedances data, used to develop the wing lower surface loads spectrum, were:

| Loading Environment | Basic Parameter | Source |
|---------------------|-----------------------|-------------------------------|
| Taxi | Cg load factor | MIL-A-008866B + modifications |
| Flight maneuvers | Cg load factor | MIL-A-008866B |
| Flight gusts | Turbulence parameters | MIL-A-008861A |
| Landing impact | Sink rate | MIL-A-008866B + modifications |

The development and use of the exceedances data in terms of airplane cg vertical load factor was as follows:

Taxi — The cg load factor spectrum for transport aircraft, design LF \leq 2.5, from MIL-A-008866B, was used to represent taxi, takeoff run and landing roll loadings on paved runways (CTOL operations). For operations on semiprepared runways (STOL operations), the spectrum incremental load factors were increased by 50 percent, based on transport data from operations on semiprepared runways. The MIL-A-008866B spectrum was evenly divided between the preflight and postflight operations. The preflight operation is considered to represent preflight taxi and takeoff run. The postflight operation is considered to represent landing rollout and postflight taxi. The ground loads for touch-and-go landings were represented by taking 60 percent of the above spectra occurrences. The incremental load factor, Δg , exceedances used in the spectrum development are given in Table 2-2.

The cycles, before randomization in the load sequencing process were defined as $(1\pm\Delta g)$. Since the chosen wing lower surface element experiences only compression stresses during these ground operations, cycles with Δ g<0.3 for prepared runways and cycles with Δ g<0.4 for semiprepared runways were excluded from the spectrum. This was done on the assumption that elimination of small range compression-compression cycles will not affect crack growth rates as well as to reduce the cost spectrum generation, crack propagation analysis and testing. It should be noted that this was investigated in the spectra variations. Increase of taxi cycles per landing,

TABLE 2-2
TAXI SPECTRUM

| | EXCEEDANCES PER 1000 OPERATIONS | | | | | | | |
|--|--------------------------------------|--------------|--------------------------------------|--------------|--|--|--|--|
| $ \begin{array}{c} \text{INCREMENTAL} \\ \text{LOAD FACTOR} \\ \pm \Delta \text{g} \\ \\ 0.3 \\ 0.4 \\ 0.5 \\ 0.6 \\ 0.7 \\ 0.8 \\ 0.9 \\ 1.0 \\ \end{array} $ | PREPARED R | UNWAY | SEMI-PREPARED | RUNWAY | | | | |
| | FULL OPERATION PRE- OR POSTFLIGHT | TOUCH AND GO | FULL OPERATION PRE- OR POSTFLIGHT | TOUCH AND GO | | | | |
| 0.3 | 2094 | 1256 | | | | | | |
| 0.4 | 94.2 | 56.5 | 5000 | 3000 | | | | |
| 0.5 | 4.2 | 2.5 | 750 | 450 | | | | |
| 0.6 | 0.155 | 0.093 | 100 | 60 | | | | |
| 0.7 | 0.005 | 0.003 | 15 | 9 | | | | |
| 0.8 | 0 | 0 | 2 | 1.2 | | | | |
| 0.9 | | | 0.3 | 0.18 | | | | |
| 1.0 | | | 0.05 | 0.03 | | | | |
| 1.1 | , | | 0 | 0 | | | | |

from an average of 3.5 to 25.9, by including more small range cycles, increased the crack growth rate by 18 percent. This is a test result. Whether this difference is significant must be viewed in the light of scatter in test results and the fact that the test sample is one.

Maneuvers — The following load factor spectra from MIL-A-008866B were used for the following flights and appropriate flight segments:

| Spectrum | Flights | Remarks | | |
|---|----------------------------------|---|--|--|
| C _{ASSAULT} C _{TRANSPORT} (Logistics) C _{TRANSPORT} (Training) | 1a, 3a 1b, 2, 3b 4a, 4b, 5 | GW<171,000 lb, DLLF* = 3.0 GW>171,000 lb, DLLF* = 2.5 Training Missions | | |

^{*}DLLF = design limit load factor

These exceedances spectra, for computer calculations convenience, were represented in equation form as shown in Table 2-3. Cycles with $\Delta g < 0.1$ were excluded from the spectrum. Considering a typical 1.0g flight stress to be about 9000 psi (see Figure 2-3), this typically left out cycles with stress ranges less than 1800 psi. The averaging interval was $\Delta g = 0.1$.

TABLE 2-3 MANEUVER SPECTRUM

EQUATION (EXCEEDANCES PER 1000 FLIGHT HOURS):

1.
$$\Sigma n (\Delta g) = N_0 e^{-\Delta g/b} + N_0 e^{-\Delta g/b}$$

1.
$$\Sigma n (\Delta g) = N_{o_1} e^{-\Delta g/b_1} + N_{o_2} e^{-\Delta g/b_2}$$

2. $\Sigma n (\Delta g) = N_{o_1} e^{-\Delta g^2/2b_1^2} + N_{o_2} e^{-\Delta g^2/2b_2^2}$

| | | | EQUATION | | | | | LAR | GEST |
|---|----------|-----|----------|-----------------------|--|----------------|----------------|-----|-------------|
| SPECTRUM | SEGMENT | (1) | NO. | N _{o1} | N _{o2} | b ₁ | b ₂ | +∆g | $-\Delta g$ |
| C _{TRANSPORT} (LOGISTICS) C _{TRANSPORT} (TRAINING) | 01.1145 | ± | 1 | 2.7 x 10 ⁵ | 2.5 x 10 ² | 0.0492 | 0.1646 | 1.1 | 1.1 |
| | CLIMB | + | 1 | 9×10^4 | 50 | 0.0869 | 0.2877 | 1.3 | _ |
| 2 | | ± | 1 | 4 x 10 ⁴ | 1 x 10 ³ | 0.0523 | 0.0986 | 0.9 | 0.9 |
| CASSAULT | CRUISE | + | 1 | 2.1×10^4 | 62 | 0.0921 | 0.2621 | 1.7 | - |
| | DESCENT | ± | 1 | 1.9×x 10 ⁵ | 0 | 0.0543 | _ | 0.7 | 0.7 |
| | | + | 1 | 1.7×10^5 | 4.5×10^{2} | 0.0942 | 0.2311 | 2.3 | - |
| | 0 | ± | 2 | 9×10^{3} | 1×10^{3} | 0.120 | 0.1614 | 0.7 | 0.7 |
| | CLIMB | + | 1 | 2.6×10^5 | 54 | 0.06157 | 0.2942 | 1.1 | _ |
| | 0.011105 | ± | 2 | 4.52×10^2 | 95 | 0.1452 | 0.1885 | 0.7 | 0.7 |
| CTRANSPORT | CRUISE | + | 1 | 9 x 10 ⁴ | 75 | 0.0408 | 0.1687 | 0.9 | - |
| (LOGISTICS) | DECOENT | ± | 2 | 8.83×10^3 | 2.2×10^2 | 0.1336 | 0.1827 | 0.7 | 0.7 |
| | DESCENT | + | 1 | 3.5×10^5 | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 0.05509 | 0.19054 | 0.9 | - |
| C _{ASSAULT} C _{TRANSPORT} (LOGISTICS) C _{TRANSPORT} | CLIMB | ± | 1 | 1.6 x 10 ⁵ | | 0.0598 | _ | 0.7 | 0.7 |
| | | + | 1 | 5.2×10^5 | 2.7×10^3 | 0.0835 | 0.1820 | 1.7 | - |
| CTRANSPORT | | ± | 1 | 4 × 10 ⁴ | 0 | 0.0566 | _ | 0.7 | 0.7 |
| | CRUISE | + | 1 | 4.6×10^5 | | 0.0843 | 0.2966 | 1.3 | - |
| | DESCENT | ± | 1 | 5.5×10^4 | 9.5×10^3 | 0.0476 | 0.0841 | 0.9 | 0.9 |
| | DESCENT | + | 1 | 5.4 x 10 ⁵ | 1.6 x 10 ⁴ | 0.0670 | 0.1922 | 1.9 | - |

(1) PROGRAM A6PA CYCLE FORMAT (REFERENCE 1):

±: (1 ± Δg)

+: $[(1 + 1/2\Delta g) \pm 1/2\Delta g]$

Gusts - The airplane cg vertical load factor exceedances due to vertical gusts were based on the PSD definition of the atmosphere turbulence. The exceedance spectrum for each segment of the flight profile was calculated using the equation,

$$\Sigma n(\Delta g) = d \left[N_{0_1}^{} P_1^{} e^{-\Delta g/b_1^{} \overline{A}} + N_{0_2}^{} P_2^{} e^{-\Delta g/b_2^{} \overline{A}} \right]$$

where,

d = distance, in nautical miles, flown in a given segment.

P,b - Turbulence parameters, function of altitude, from MIL-A-008861A.

N - Gust cycles per nautical mile in continuous turbulence:

 $N_{O_1}=18.06$ and $N_{O_2}=18.98$ for all segments, except $N_{O_1}=11.5$ and $N_{O_2}=17.5$ for 0- to 1000-foot segments in climb, cruise or descent, and, $N_{O_1}=11.5$ and $N_{O_2}=8.63$ for low-level penetration flying.

 $\bar{A} = \sigma_{\Delta_g} / \sigma_u = \text{gust response factor.}$

The \bar{A} is calculated for each segment of the mission profile, accounting for variation in airplane gross weight and speed, for a one-degree-of-freedom (vertical translation) case,

 $\bar{A} = (V_e mS/498W) K_{\sigma_{ij}}$

V_e = airplane speed

m = airplane lift curve slope

S = wing area

W = airplane weight

 $K_{\sigma_{u}} = \text{gust alleviation factor based on PSD definition of the atmospheric turbulence,}$ $\phi(\Omega)$

 ϕ (Ω) = PSD spectrum shape

$$= \frac{L}{\pi} \frac{1 + 3\Omega^2 L^2}{(1 + \Omega^2 L^2)^2}$$

L = scale of turbulence, feet, function of altitude, from MIL-A-008861A.

 Ω = reduced frequency, radians/ft

The cycle format in Program A6PA (Reference 1) was taken as $(1\pm\Delta g)$. All cycles with $\Delta g < 0.1$ were excluded from the spectrum. Considering a typical 1.0g flight stress to be around 9000 psi (see Figure 2-3), this typically left out cycles with stress ranges less than 1800 psi. The averaging interval was $\Delta g = 0.1$. The maximum gust load factors in the spectrum were values with corresponding $n \ge 0.5$.

Low-Level Penetration Maneuvers and Gusts — Low-level penetration flying maneuvers were the applicable cruise segment spectra as described in the preceding maneuvers discussion. The gusts were calculated by using the low-level contour gust parameters (P, b, L) from MIL-A-008861A in the gust equation as described in the preceding gust discussion.

Landing Impact — The basic spectrum is defined in term of airplane sink rate at impact. The sink rate spectrum from MIL-A-008866B was used for conventional landings. This spectrum was modified for STOL landings to reflect the higher sink rates. The sink rates were converted to airplane cg vertical incremental load factors using a transfer function established from dynamic response analysis. The resulting spectra are given in Table 2-4. The cycle, one per landing, in the program A6PA (Reference 1) format, was defined as $(1 - \Delta y/2) \pm \Delta y/2$). Additional landing impact response cycles are considered to be included in the landing rollout spectrum.

TABLE 2-4
LANDING IMPACT SPECTRUM

| INCREMENTAL | EXCEEDANCES PER | 1000 LANDING | | | |
|------------------------|--------------------------|--------------------------|--|--|--|
| LOAD FACTOR Δg | CONVENTIONAL LANDINGS | STOL LANDINGS 1000 | | | |
| 0.1 | 900 | | | | |
| 0.2 | 530 | 900 | | | |
| 0.3 | 50 | 600 | | | |
| 0.4 | 9 | 450 | | | |
| 0.5 | 4.3 | 320 | | | |
| 0.6 | 2.2 | 250 | | | |
| 0.7 | 1.3 | 210 | | | |
| 8.0 | 0.65 | 163 | | | |
| 0.9 | 0 | 133 | | | |
| 1.0 | | 110 | | | |
| 1.2 | | 70 | | | |
| 1.4 | | 50 | | | |
| 1.6 | | 37 | | | |
| 1.8 | | 26 | | | |
| 2.0 | | 20 | | | |
| 2.2 | | 15.5 | | | |
| 2.4 | | 11.3 | | | |
| 2.6 | | 7.4 | | | |
| 2.8 | | 4.8 | | | |
| 3.0 | | 3.2 | | | |
| 3.2 | | 2.2 | | | |
| 3.4 | | 0 | | | |

2.1.3 Load Factor-Stress Transfer Functions

The transfer functions were calculated in terms of F and P, as presented in Appendix A, where

$$\sigma = (LF \cdot F) + P$$

= gross area stress, psi

LF = airplane cg vertical load factor

 $F = d\sigma/dLF$

P = stress at LF of zero.

The F and P values were calculated for the various flight segments to reflect the effect of airplane configuration on load factor-stress relationships. Typically, a set of F and P values were calculated for the following segments: preflight ground, initial climb with flaps down, climb with flaps up, cruise, descent with flaps up and flaps down, landing impact and postflight ground. Pre- and postflight ground F is the 1.0g static stress on ground (P = 0) used for taxi segments. The same F and P values are used for gusts and maneuvers, with the values being based on steady symmetrical maneuver conditions. No dynamic amplification factors are included in these values, considering them to be small for the structural element chosen, i.e., wing root, in the proximity of the airplane cg. Landing impact values are based on dynamic analysis results.

A good indicator of the stress contents of the stress spectrum is the 1.0g stress, the steady state value of a balanced airplane. The distribution of segment 1.0g stresses is shown in Figure 2-3. The ground stresses are high compression values, ranging from -5000 to -11,000 psi, reflecting the fact that the airplane has a high wing and the landing gear is in the fuselage. The landing impact values reflect the 1.0g stress just before impact. Flight stresses range between 5000 and 14,000 psi, with most values falling between 8000 and 10,000 psi.

These 1.0g stresses, and the F and P values in Appendix A, reflect YC-15 early design values. They correspond to a design limit gross stress of 34,650 psi for the 7475-T7651 wing skin material considered in this study. Later C-15 design stress levels were lowered, because of changed capability requirements, material changes, and more refined damage tolerance and durability analyses.

2.2 LOADING SEQUENCE GENERATION METHOD

The spectrum loading sequences were generated by a Douglas Aircraft Company program A6PD described in detail in the user's manual, Reference 1. The program outline is given in Figure 2-4. The basic features of the program are:

- Stress occurrences, in the form of valleys and peaks, are defined for each segment of the flight, from the exceedances spectra. The exceedance spectra are defined for a specified number of flights.
- 2. The valley-peak pairs, to define cycles, may be a preselected coupling or a random coupling of valleys and peaks within a given segment. The random coupling is accomplished by a standard random number generator.
- 3. The sequence of segments is the natural sequence of their occurrence in the flight.

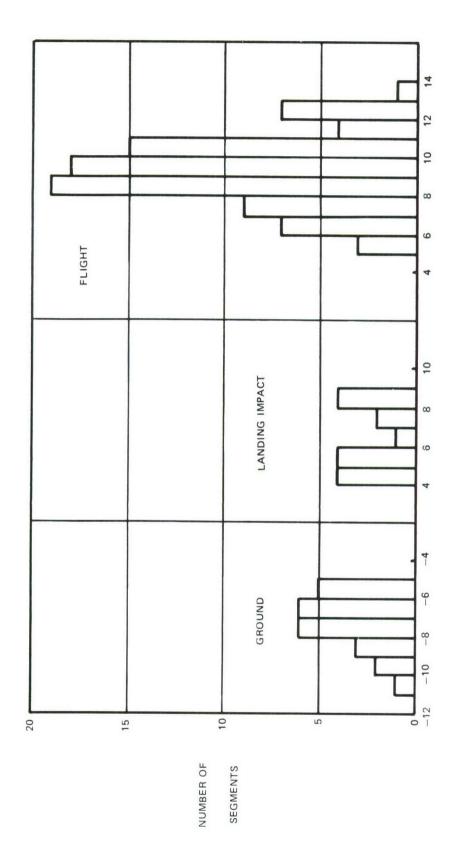


FIGURE 2-3. DISTRIBUTION OF 1.0g STRESSES

1.0g STRESS, KSI

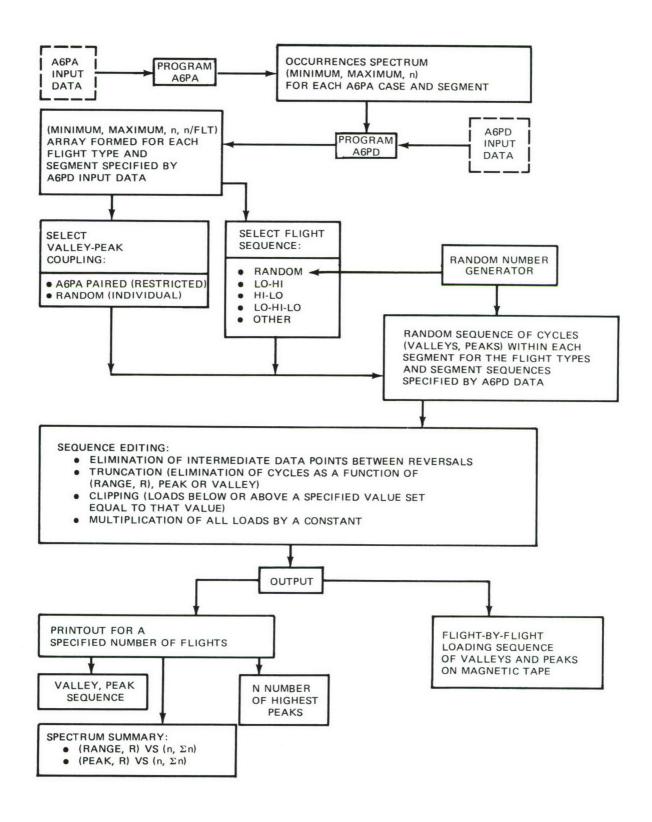


FIGURE 2-4. SPECTRUM LOADING SEQUENCE GENERATION PROGRAM A6PD

- 4. The sequence of different types of flights may be random, through the use of the standard random number generator, lo-hi, hi-lo or lo-hi-lo on the basis of the largest peak in the flight, or any specific sequence desired.
- 5. The spectrum so generated may be edited by eliminating (truncating) cycles on the basis of (range, R), valley or peak values, clipping (loads below or above a specified value set equal to that value), or increasing or decreasing all the stresses in the spectrum by a constant.
- 6. The resulting spectrum is a random sequence of valleys and peaks with groups of valleys and peaks identified as flights. The natural sequence of segments within a flight is preserved, unless there is a reason not to do so. The number of cycles per flight, even for the same type of flight, may vary from flight to flight because of the random selection of cycles and editing.
- 7. For a specified number of flights, the program output consists of a valley-peak sequence, a specified number of highest peaks, and the spectrum peak, range and R distribution as occurrences and exceedances spectra. The valley-peak sequence also may be stored on magnetic tape for easy access for further analysis or testing. A portion of a spectrum so generated is illustrated in Figure 2-5.

2.3 STRESS BASELINE SPECTRA AND SPECTRA VARIATIONS

The effect of spectrum variations on crack growth was studied analytically and experimentally through the 116 spectra generated for this program. The 116-spectrum matrix is shown by Table 2-5, including the matrix of 33 spectra tested. The variations were chosen to reflect possible spectrum variations in a fleet of aircraft as well as to investigate spectrum development procedures. Coding and descriptions of all the spectra are given in Table 2-6. Pertinent information summaries for each spectrum, including peak, range and R distributions, are provided in Appendix B.

The basic baseline spectrum, to which all variations are compared, is spectrum BS6 (No. 6), representing the composite mission utilization defined in Table 2-1. A portion of this spectrum, in the form of a test strip chart record, is illustrated in Figure 2-5. It must be noted that for a given flight segment (constant 1.0g stress), the irregularity factor (ratio of the number of 1.0g level crossings with positive slope to the number of peaks) is one. In other words, it means that the loading always crosses or reaches the 1.0g level between two adjacent peaks.

The major features of spectrum BS6 and those of all other spectra, shown in Table 2-7, illustrate the large scope of their variations. Other spectrum BS6 features to be noted, see Table B-6, are:

1. 85 percent of all cycles have peaks between 9000 and 15,000 psi.

- 2. 91 percent of all cycles have ranges between 4000 and 7000 psi.
- 3. 87 percent of all cycles have R values between 0.4 and 0.7.

These features are similar in many of the spectra variations, see Appendix B, unless a variation was directed specifically to one or more of these parameters. As an additional illustration of spectrum BS6, Figure 2-6 presents the peak, range and R distribution from Table B-6 as exceedances spectra and Table 2-8 gives the peak and range versus R occurrences.

As shown in Table 2-5, the spectra variations, in addition to the baseline spectra, were divided into 12 categories. A discussion, describing each of these categories, follows.

2.3.1 Baseline Spectra (BS)

Five other baseline spectra, in addition to the basic spectrum BS6 discussed earlier, were developed to represent the five individual missions of the C-15 utilization defined in Table 2-1. In spectra BS1, BS3 and BS4, the distribution of individual flights was taken as the distribution of the flights for the specific mission shown in Table 2-1. All of the baseline spectra have the following features:

- 1. Each spectrum represents 2500 flight hours. This is one-tenth of expected life requirement for the C-15. The input exceedances spectra times are such as to produce a total time of 2500 flight hours, as opposed to defining the input spectrum for a lifetime and then randomly selecting one-tenth of the spectrum. Thus, the highest loads in the spectrum are those which occur at least once in 2500 flight hours. (Technically, since fractions of cycles are rounded off to integers in the spectrum sequence generation, all loads which occur $n \ge 0.5$ in a given segment spectrum are included in the spectrum.)
- 2. Valley-peak coupling and cycle and flight sequences are random.
- 3. Segment sequences are the natural sequences within a flight.
- 4. The range truncation level was set at 4000 psi. This means that cycles with ranges less than 4000 psi were excluded from the spectra. This level was chosen on the expectation that the exclusion of small range cycles will not materially affect the comparative nature of this study. Economic consideration, with respect to testing and analysis costs, also influenced this selection.
- 5. The basic load factor exceedances spectra were as defined in Paragraph 2.1.2.

These spectrum features are the same in all subsequent spectra variations unless a feature itself becomes a variable.

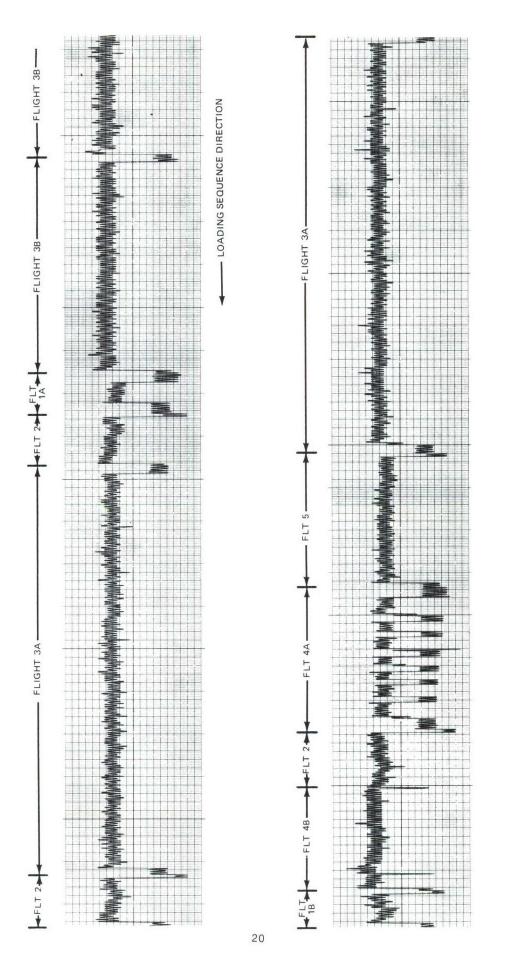


FIGURE 2-5. PORTION OF THE BASELINE SPECTRUM BS6

TABLE 2-5
SPECTRA VARIATIONS MATRIX

| | | MIS | MISSION (BASELINE SPECTRA NUMBER) | TRA NUMBER) | | | |
|-------------------------------|---|--------------------------------|-----------------------------------|--------------------------|---------------------------|------------------|----------|
| TYPE OF VARIATION | BASIC AND ALTERNATE EMPLOYMENT (1) | LONG-RANGE LOGISTICS (2) | LOW-ALTITUDE RESUPPLY (3) | BASIC TRAINING (4) | COMBAT TRAINING (5) | COMPOSITE (6) | TOTAL |
| BASELINE SPECTRA (BS) | <u>-</u> | 0 | <u>(</u> | Θ | Θ | Θ | 9 |
| MISSION MIX (MM) | 2 | 1 | 2 | 3 (1) | I | 0 ′ | 14 ② |
| SEQUENCE OF MISSIONS (SM) | 1 | I | 1 | 1 | 1 | е | 4 |
| INDIVIDUAL FLIGHT LENGTH (FL) | 6 (1) | 1 | 1 | 1 | 1 | 1 | 6 ① |
| FLIGHT SEGMENTS (FS) | 3 | I | 1 | 1 | 1 | 2 | 2 |
| EXCEEDANCES SPECTRA (ES) | _ | 1 | ı | ı | 1 | 4 | 4 |
| DESIGN STRESS LEVEL (DSL) | 2 | 1 | 2 | 2 | 1 | 4 | 10 ③ |
| VALLEY-PEAK COUPLING (VPC) | 1 | 1 | 1 (1) | 1 | 1 | 1 | (-) 9 |
| LOW LOAD TRUNCATION (LLT) | 3 ② | I | 4 | 3 | 1 | © 9 | 16 (5) |
| HIGH INFREQUENT LOADS (HIL) | 9 | I | 9 | 1 | 1 | (g) 9 | 18 ⑤ |
| CLIPPING OF LARGE LOADS (CLP) | 1 | 1 | 1 | 1 | 1 | 0 4 | 4 |
| MISCELLANEOUS (MISC) | 2 ① | ı | 1 | 1 | 1 | 7 ② | 10 ③ |
| COMBINED (COMB) | 1 | 1 | 1 | 1 | 1 | 13 6 | 13 6 |
| TOTAL | 27 (5) | 2(1) | 17 (2) | 10 ② | 2① | 58 (2) | 116 ③ |

O= SPECTRA TESTED

TABLE 2-6
BASELINE SPECTRA AND SPECTRA VARIATIONS

| 1 * B 2 * B 3 * B 4 * B 5 * B 6 * B 8 * B 9 B 10 B 11 B 15 B 16 B 17 B 18 B 19 * B 10 B 10 B 11 B 15 B 16 B 17 B 18 B 19 * B 10 B | IDENTIF | AVERAGE FLIGHT HOURS PER FLIGHT | OF CYCLES PER FLIGHT | |
|--|--|---|--|---------------|
| 1 * BS 2 * BS 3 * BS 4 * BS 5 * BS 6 * BS 7 BS 8 BS 9 BS 10 BS 11 BS 12 BS 13 BS 14 * BS 15 BS 16 BS 17 BS 18 BS 19 * BS 20 BS 21 BS 22 BS 23 BS 24 BS 25 BS 24 BS 27 BS 28 BS 29 BS 30 * BS 31 BS 33 BS 34 BS 35 BS | IDENTIF | DESCRIPTION | PERFEIGHT | TENTEIGHT |
| | 201 | BASELINE SPECTRA (BS) | 0.989 | 18.1 |
| | | MISSION 1 (FLIGHTS 1A AND 1B), BASIC AND ALTERNATE EMPLOYMENT | 5.725 | 23.9 |
| | Law State of the S | MISSION 2 (FLIGHT 2), LONG RANGE LOGISTICS | The state of the s | 127.0 |
| | BS3 | MISSION 3 (FLIGHTS 3A AND 3B), LOW ALTITUDE RESUPPLY | 0.489 | 64.0 |
| | BS4 | MISSION 4 (FLIGHTS 4A AND 4B), BASIC TRAINING | 0.804 0.78 | 61.5 |
| | BS5 BS6 | MISSION 5 (FLIGHT 5), COMBAT TRAINING MISSIONS 1-5, COMPOSITE SPECTRUM | 1.032 | 75.0 |
| | | MISSION MIX (MM) | | |
| 7 | BS1.MM1A | FLIGHT 1A ONLY | 0.989 | 19.6 |
| 8 | BS1.MM1B | FLIGHT 1B ONLY | 0.989 | 16.4 |
| 9 | BS3.MM3A | FLIGHT 3A ONLY | 0.489 | 191.5 |
| 10 | BS3.MM3B | FLIGHT 3B ONLY | 0.489 | 88.4 |
| 11 | BS4.MM4A | FLIGHT 4A ONLY | 0.965 | 72.5 |
| 12 | BS4.MM4B | FLIGHT 4B ONLY | 0.54 | 51.6 |
| 13 | BS45.MM7 | TRAINING ONLY (MISSIONS 4 AND 5) | 0.793 | 62.9 |
| 14* | BS4.MM8 | TOUCH AND GO LANDINGS ONLY FROM MISSION 4 | 0.41 | 40.7 |
| 15 | BS123.MM9 | MISSION 1, 2, AND 3 MIX, NO TRAINING (NO MISSIONS 4 AND 5) | 1.116 | 79.3 |
| 16 | BS6.MM10 | BS6 SPECTRUM WITH 50-PERCENT REDUCTION IN TRAINING | 1.005 | 80.6 |
| 17 | BS13.MM11 | FLIGHTS 1A AND 3A MIX (LOW PAYLOAD), NO TRAINING | 0.701 | 118.7 |
| 18 | BS123.MM12 | FLIGHTS 1B, 2, AND 3B MIX (HIGH PAYLOAD), NO TRAINING | 1.36 | 57.4 |
| | BS6.MM13 | BS6 SPECTRUM WITHOUT LOW-ALTITUDE PENETRATION FLYING (LAPF), | 1.36 | 28.3 |
| | | (NO MISSION 3 AND NO LAPF SEGMENT IN MISSION 5) | | |
| 20 | BS6.MM14 | BS6 SPECTRUM WITH 100-PERCENT INCREASE IN LOW-ALTITUDE | 0.77 | 95.8 |
| | | PENETRATION FLYING TIME SEQUENCE OF MISSIONS (SM) | | - |
| 21 | BS1.SM1 | BS1 SPECTRUM WITH LO-HI-LO FLIGHT SEQUENCE BASED ON THE | 0.989 | 18.1 |
| 22 | BS6.SM1 | LARGEST PEAK PER FLIGHT BS6 SPECTRUM WITH LO-HI-LO FLIGHT SEQUENCE BASED ON THE | 1.032 | 75.0 |
| | | LARGEST PEAK PER FLIGHT | | |
| 23 | BS6.SM4 | BS6 SPECTRUM WITH SPECIFIC ORDERED FLIGHT SEQUENCE | 1.032 | 75.1 |
| 24 BS6.SM5 | | BS6 SPECTRUM WITH A DIFFERENT RANDOM SEQUENCE OF FLIGHTS AND CYCLES | 1.032 | 75.1 |
| | | INDIVIDUAL FLIGHT LENGTH (FL) | | |
| 25 | BS1A.FL1 | FLIGHT 1A WITHOUT CRUISE SEGMENT | 0.541 | 18.5 |
| 26 | BS1A.FL2 | 2.0-HOUR-LONG FLIGHT 1A | 2.0 | 22.0 |
| 27 | BS1A.FL3 | 4.0-HOUR-LONG FLIGHT 1A | 4.0 | 26.4 |
| 28 | BS1B.FL1 | FLIGHT 1B WITHOUT CRUISE SEGMENT | 0.605 | 16.6 |
| 29 | BS1B.FL2 | 2.0-HOUR-LONG FLIGHT 1B | 2.0 | 21.8 |
| 30 * | BS1B.FL3 | 4.0-HOUR-LONG FLIGHT 1B | 4.0 | 29.2 |
| 31 | BS6.FS1 | FLIGHT SEGMENTS (FS) BS6 SPECTRUM WITHOUT LANDING IMPACT CYCLES | 1.032 | 74.7 |
| | BS6.FS2 | BS6 SPECTRUM WITH FLAPS UP CLIMB AND DESCENT GUST SEGMENTS | 1.032 | 74.5 |
| | | SIMPLIFIED INTO ONE SEGMENT FOR CLIMB AND ONE FOR DESCENT | 0.000 | 45.0 |
| | BS1.FS3 | BS1 SPECTRUM WITH GUST SPECTRUM SIMPLIFICATION AS IN NUMBER 32 | 0.989 | 15.8 |
| 34 | BS1.FS4 | BS1 SPECTRUM WITH FLAPS UP CLIMB AND DESCENT LOAD FACTOR-STRESS TRANSFER FUNCTION THE SAME AS FOR CRUISE SEGMENT | 0.989 | 18.0 |
| 35 | BS1.FS5 | BS1 SPECTRUM WITH ALL CLIMB AND DESCENT LOAD FACTOR-STRESS | 0.989 | 17.2 |
| | | TRANSFER FUNCTIONS THE SAME AS FOR CRUISE | | |
| | | EXCEEDANCE SPECTRA (ES) | | 19219 |
| 36 | BS6.ES1 | BS6 SPECTRUM WITH NUMBER OF GUST AND MANEUVER CYCLES | 1.032 | 85.1 |
| 37 | BS6.ES2 | INCREASED BY 15 PERCENT BS6 SPECTRUM WITH NUMBER OF GUST AND MANEUVER CYCLES | 1.032 | 65.0 |
| | | DECREASED BY 15 PERCENT | 2.00 | |
| 38 | BS6.ES3 | BS6 SPECTRUM WITH THE SLOPE OF GUST AND MANEUVER EXCEEDANCE SPECTRA INCREASED BY 15 PERCENT | 1.032 | 105.8 |
| 39 * | BS6.ES4 | BS6 SPECTRUM WITH THE SLOPE OF GUST AND MANEUVER EXCEEDANCE | 1.032 | 48.5 |
| | | SPECTRA DECREASED BY 15 PERCENT | | |
| | BO4 BS: 1 | DESIGN STRESS LEVEL (DSL) | 0.000 | 10 1 |
| | BS1.DSL1 | BS1 SPECTRUM STRESSES INCREASED BY 15 PERCENT, RT = 4,000 (1.15) | 0.989 | 18.1 |
| | BS3.DSL1 | BS3 SPECTRUM STRESSES INCREASED BY 15 PERCENT, RT = 4,000 (1.15) | 0.489 | 127.0 |
| | BS4.DSL1 | BS4 SPECTRUM STRESSES INCREASED BY 15 PERCENT, RT = 4,000 (1.15) | 0.804 | 64.0 |
| | BS6.DSL1 | BS6 SPECTRUM STRESSES INCREASED BY 15 PERCENT, RT = 4,000 (1.15) | 1.032 | 75.0 |
| | BS1.DSL2 | BS1 SPECTRUM STRESSES DECREASED BY 10 PERCENT, RT = 4,000 (0.9) | 0.989 | 18.1 127.0 |
| | BS3.DSL2 | BS3 SPECTRUM STRESSES DECREASED BY 10 PERCENT, RT = 4,000 (0.9) | 0.489 | |
| | BS4.DSL2 | BS4 SPECTRUM STRESSES DECREASED BY 10 PERCENT, RT = 4,000 (0.9) | 0.804 | 64.0 |
| | BS6.DSL2 | BS6 SPECTRUM STRESSES DECREASED BY 10 PERCENT, RT = 4,000 (0.9) | 1.032 | 75.0 |
| 48 * | BS6.DSL3 | BS6 SPECTRUM STRESSES DECREASED BY 26 PERCENT, RT = 4,000 (0.74) BS6 SPECTRUM STRESSES INCREASED BY 35 PERCENT, RT = 4,000 (1.35) | 1.032 1.032 | 75.0 75.0 |
| 49 * | BS6.DSL4 | | | |

^{*} SPECTRA TESTED

TABLE 2-6 (CONT)

| NO. | IDENTIF | DESCRIPTION | AVERAGE FLIGHT HOURS PER FLIGHT | OF CYCLES PER FLIGHT | |
|-------------|------------|--|---------------------------------------|-------------------------|--|
| | | VALLEY/PEAK COUPLING (VPC) | | | |
| 50 | BS1.VPC1 | BS1 SPECTRUM WITH DIFFERENT (A6PA) V/P COUPLING | 0.989 | 16.8 | |
| 51 | BS2.VPC1 | BS2 SPECTRUM WITH DIFFERENT (A6PA) V/P COUPLING | 5.725 | 20.2 | |
| 52 * | BS3.VPC1 | BS3 SPECTRUM WITH DIFFERENT (A6PA) V/P COUPLING | 0.489 | 76.0 | |
| 53 | BS4.VPC1 | BS4 SPECTRUM WITH DIFFERENT (A6PA) V/P COUPLING | 0.804 | 64.1 | |
| 54 | BS5.VPC1 | BS5 SPECTRUM WITH DIFFERENT (A6PA) V/P COUPLING | 0.78 | 71.5 | |
| 55 | BS6.VPC1 | | 1.032 | 54.9 | |
| 55 | BS6.VPC1 | BS6 SPECTRUM WITH DIFFERENT (A6PA) V/P COUPLING | 1.032 | 54.9 | |
| 56 | BS1.LLT1 | LOW LOAD TRUNCATION (LLT) BS1 SPECTRUM WITH 4500 PSI RANGE TRUNCATION | 0.989 | 15.6 | |
| 57 * | BS3.I.LT1 | BS3 SPECTRUM WITH 4500 PSI RANGE TRUNCATION | 0.489 | 91.0 | |
| 58 | BS4.LLT1 | BS4 SPECTRUM WITH 4500 PSI RANGE TRUNCATION | 0.804 | 52.0 | |
| Parameter 1 | BS6.LLT1 | Burnel State (State Control of the C | 1.032 | 54.0 | |
| 59 | | BS6 SPECTRUM WITH 4500 PSI RANGE TRUNCATION | | | |
| 60 | BS1.LLT2 | BS1 SPECTRUM WITH 3500 PSI RANGE TRUNCATION | 0.989 | 32.6 | |
| 61 * | BS3.LLT2 | BS3 SPECTRUM WITH 3500 PSI RANGE TRUNCATION | 0.489 | 228.7 | |
| 62 | BS4.LLT2 | BS4 SPECTRUM WITH 3500 PSI RANGE TRUNCATION | 0.804 | 112.5 | |
| 63 * | BS6.LLT2 | BS6 SPECTRUM WITH 3500 PSI RANGE TRUNCATION | 1.032 | 128.5 | |
| 64 | BS1.LLT3 | BS1 SPECTRUM WITH 3000 PSI RANGE TRUNCATION | 0.989 | 38.0 | |
| 65 | BS3.LLT3 | BS3 SPECTRUM WITH 3000 PSI RANGE TRUNCATION | 0.489 | 308.8 | |
| 66 | BS4.LLT3 | BS4 SPECTRUM WITH 3000 PSI RANGE TRUNCATION | 0.804 | 134.6 | |
| 67 | BS6.LLT3 | BS6 SPECTRUM WITH 3000 PSI RANGE TRUNCATION | 1.032 | 175.6 | |
| 68 | BS6.LLT4 | BS6 SPECTRUM WITH ONLY ONE TAXI CYCLE PER LANDING, AS OPPOSED | 1.032 | 69.6 | |
| 69 * | BS6.LLT5 | TO 3.5 CYCLES IN BS6 SPECTRUM BS6 SPECTRUM WITH AN AVERAGE OF 25.9 TAXI CYCLES PER LANDING. | 1.032 | 110.7 | |
| 09 + | B30.EE13 | The state of the s | 1.032 | 110.7 | |
| 70 | DC2 1 1 T4 | AS OPPOSED TO 3.5 CYCLES IN BS6 SPECTRUM | 0.400 | 00.0 | |
| 70 | BS3.LLT4 | BS3 SPECTRUM WITH 5000 PSI RANGE TRUNCATION | 0.489 | 90.9 | |
| 71 * | BS6.LLT6 | BS6 SPECTRUM WITH 5000 PSI RANGE TRUNCATION | 1.032 | 48.5 | |
| 72 | BS1.HIL1 | HIGH INFREQUENT LOADS (HIL) BS1 SPECTRUM WITH THE NUMBER OF TEN HIGHEST PEAKS INCREASED TO 100 | 0.989 | 18.2 | |
| 73 | BS1.HIL2 | BS1 SPECTRUM WITH THE NUMBER OF TEN HIGHEST PEAKS INCREASED TO 200 | 0.989 | 18.2 | |
| 74 | BS1.HIL3 | BS1 SPECTRUM WITH THE TEN HIGHEST PEAKS SET EQUAL TO 33,056 PSI | 0.989 | 18.1 | |
| 75 | BS1.HIL4 | BS1 SPECTRUM WITH THE TEN HIGHEST PEAKS SET EQUAL TO 27.750 PSI | 0.989 | 18.1 | |
| 76 | BS3.HIL1 | BS3 SPECTRUM WITH THE NUMBER OF TEN HIGHEST PEAKS INCREASED TO 100 | 0.489 | 127.1 | |
| 77 | BS3.HIL2 | BS3 SPECTRUM WITH THE NUMBER OF TEN HIGHEST PEAKS INCREASED TO 200 | 0.489 | 127.1 | |
| 78 | BS3.HIL3 | BS3 SPECTRUM WITH THE TEN HIGHEST PEAKS SET EQUAL TO 33.056 PSI | 0.489 | 127.0 | |
| 79 | BS3.HIL4 | BS3 SPECTRUM WITH THE TEN HIGHEST PEAKS SET EQUAL TO 27,750 PSI | 0.489 | 127.0 | |
| * 08 | BS6.HIL1 | BS6 SPECTRUM WITH THE NUMBER OF TEN HIGHEST PEAKS INCREASED TO 100 | 1.032 | 75.0 | |
| 81 * | BS6.HIL2 | BS6 SPECTRUM WITH THE NUMBER OF TEN HIGHEST PEAKS INCREASED TO 200 | 1.032 | 75.1 | |
| 82 * | BS6.HIL3 | BS6 SPECTRUM WITH THE TEN HIGHEST PEAKS SET EQUAL TO 33,056 PSI | 1.032 | 75.0 | |
| 83 * | BS6.HIL4 | BS6 SPECTRUM WITH THE TEN HIGHEST PEAKS SET EQUAL TO 27,750 PSI | 1.032 | 75.0 | |
| 84 | BS1.HIL5 | BS1 SPECTRUM WITH THE TEN HIGHEST PEAKS SET EQUAL TO 33,056 PSI AND THEIR NUMBER INCREASED TO 200 | 0.989 | 18.2 | |
| 85 | BS1.HIL6 | BS1 SPECTRUM WITH THE TEN HIGHEST PEAKS SET EQUAL TO 27,750 PSI AND THEIR NUMBER INCREASED TO 200 | 0.989 | 18.2 | |
| 86 | BS3.HIL5 | BS3 SPECTRUM WITH THE TEN HIGHEST PEAKS SET EQUAL TO 33,056 PSI AND THEIR NUMBER INCREASED TO 200 | 0.489 | 127.1 | |
| 87 | BS3.HIL6 | BS3 SPECTRUM WITH THE TEN HIGHEST PEAKS SET EQUAL TO 27.750 PSI AND THEIR NUMBER INCREASED TO 200 | 0.489 | 127.0 | |
| 88 * | BS6.HIL5 | BS6 SPECTRUM WITH THE TEN HIGHEST PEAKS SET EQUAL TO 33,056 PSI AND THEIR NUMBER INCREASED TO 200 | 1.032 | 75.0 | |
| 89 | BS6.HIL6 | BS6 SPECTRUM WITH THE TEN HIGHEST PEAKS SET EQUAL TO 27,750 PSI AND THEIR NUMBER INCREASED TO 200 | 1.032 | 75.0 | |

^{*}SPECTRA TESTED

TABLE 2-6 (CONT)

| NO. | BS6.CLP3 BS6 SPECTRUM WITH STRESSES BELOW ZERO PSI SET EQUAL TO BS6 SPECTRUM WITH STRESSES BELOW –5000 PSI SET EQUAL TO BS6 SPECTRUM WITH STRESSES BELOW –5000 PSI SET EQUAL TO BS6.CLP4 BS6 SPECTRUM WITH FLIGHT INCREMENTAL LOADS AVERAGIN INTERVAL \$Ag = 0.05, AS OPPOSED TO 0.10 IN BS6 BS6.MISC2 BS6.MISC3 BS6.MISC3 BS6.MISC3 BS6.MISC3 BS6.MISC4 BS6.MISC5 BS6.MISC5 BS6.MISC6 BS6.MISC6 BS6.MISC6 BS6.MISC6 BS7.MISC7 BS6.MISC7 BS6.MISC7 BS6.MISC7 BS6.MISC7 BS6.MISC8 BS1.MISC9 BS7.MISC9 BS | DESCRIPTION | AVERAGE FLIGHT HOURS PER FLIGHT | AVERAGE NO OF CYCLES PER FLIGHT |
|-------|---|--|---------------------------------------|---------------------------------------|
| | | | | |
| 90 | BS6.CLP1 | | 1.032 | 75.0 |
| 91 | BS6.CLP2 | BS6 SPECTRUM WITH STRESSES ABOVE 17,942 PSI SET EQUAL TO 17,942 PSI | 1.032 | 75.0 |
| 92 * | BS6.CLP3 | BS6 SPECTRUM WITH STRESSES BELOW ZERO PSI SET EQUAL TO ZERO | 1.032 | 69.5 |
| 93 | BS6.CLP4 | BS6 SPECTRUM WITH STRESSES BELOW -5000 PSI SET EQUAL TO -5000 PSI | 1.032 | 73.5 |
| 94 | BS6.MISC1 | BS6 SPECTRUM WITH FLIGHT INCREMENTAL LOADS AVERAGING | 1.032 | 74.7 |
| 95* | BS6.MISC2 | BS6 SPECTRUM WITH FLIGHT INCREMENTAL LOADS AVERAGING | 1.032 | 155.2 |
| 96 | BS6.MISC3 | | 1.032 | 74.9 |
| 97 | | | 1.032 | 74.9 |
| 98 | BS6.MISC5 | Demonstration Associates (American American Amer | 1.032 | 75.0 |
| 99* | BS6.MISC6 | Character of Character State Control C | 1.032 | 73.0 |
| 100 | BS1.MISC7 | (FLIGHT 1.0g STRESSES INCREASED AND INCREMENTAL STRESSES | 0.989 | 16.7 |
| 101 | BS3.MISC8 | | 0.489 | 124.8 |
| 102* | | BS1 SPECTRUM WITH DIFFERENT SEQUENCE OF CYCLES WITHIN FLIGHT | 0.489 | 22.4 |
| 103 | BS6.MISC10 | BS6 SPECTRUM WIHTOUT TAXI, LANDING IMPACT OR GAG CYCLES | 1.032 | 67.8 |
| | | | | |
| 104 | | TRUNCATION = 3500 PSI | 1.032 | 117.8 |
| 105 | | TRUNCATION = 3000 PSI | 1.032 | 168.4 |
| 106 * | | TRUNCATION = 3500 (1.15) PSI | 1.032 | 128.5 |
| 107 | | BS6 SPECTRUM WITH 15 PERCENT HIGHER STRESSES AND RANGE TRUNCATION = 3000 (1.15) PSI | 1.032 | 175.6 |
| 108 | | BS6 SPECTRUM WITH 10 PERCENT LOWER STRESSES AND RANGE TRUNCATION = 4500 (0.9) PSI | 1.032 | 54.0 |
| 109* | | | 1.032 | 128.5 |
| 110 | | NUMBER INCREASED TO 200, AND RANGE TRUNCATION = 3500 PSI | 1.032 | 128.6 |
| 111 | | NUMBER INCREASED TO 200, AND RANGE TRUNCATION = 3500 PSI | 1.032 | 75.1 |
| 112 | BS6.COMB9 | AND THE TEN HIGHEST PEAKS = 27,750 PSI, AND THEIR NUMBER | 1.032 | 75.1 |
| 113 | BS6.COMB10 | BS6 SPECTRUM WITH 26 PERCENT LOWER STRESSES (RT = 4000 x 0.74) AND THE TEN HIGHEST PEAKS = 27,750 PSI, AND THEIR NUMBER INCREASED TO 200 | 1.032 | 75.1 |
| 114 * | BS6.COMB11 | BS6 SPECTRUM WITHOUT TAXI, LANDING IMPACT OR GAG CYCLES, FLIGHT 1.0g STRESSES = 0, AND THEN STRESSES MULTIPLIED BY 2.0 | 1.032 | 66.8 |
| 115 * | BS6.COMB12 | BS6 SPECTRUM WITH THE NUMBER OF THE TEN HIGHEST PEAKS | 1.032 | 128.6 |
| 116 * | BS6.COMB13 | SPECTRUM BS6.COMB11 WITH 35 PERCENT HIGHER STRESSES | 1.032 | 66.8 |

^{*} SPECTRA TESTED

TABLE 2-7
MAJOR FEATURES OF BASELINE SPECTRUM BS6 AND VARIATIONS

| | SPECTRUM | VARIA | TIONS |
|------------------------------------|--------------|--------------|--------------|
| | BS6 | LOW | HIGH |
| PER SPECTRUM: | | | |
| FLIGHT HOURS | 2,500 | 249 | 2,500 |
| FLIGHTS | 2,422 | 243 | 6,095 |
| LANDINGS | 3,843 | 388 | 25,000 |
| TOTAL CYCLES | 181,644 | 8,842 | 1,578,809 |
| LARGEST PEAK, PSI (PERCENT LIMIT) | 23,923 | 16,675 | 33,167 |
| | (69 PERCENT) | (48 PERCENT) | (96 PERCENT) |
| SMALLEST VALLEY, PSI | -24,298 | -32,802 | 0 |
| AVERAGE NUMBER OF: | | | |
| FLIGHT HOURS/FLIGHT | 1.032 | 0.41 | 5.725 |
| TOTAL CYCLES/FLIGHT | 75.0 | 15.6 | 308.8 |
| TAXI CYCLES/LANDING | 3.5 | 1.0 | 25.9 |
| MANEUVER AND GUST CYCLES/FLIGHT | 71.5 | 10.9 | 303.4 |
| | | | |
| RANGE TRUNCATION, PSI | 4,000 | 3,000 | 5,000 |
| VALLEY/PEAK COUPLING | RANDOM | RESTR | ICTED |



FIGURE 2-6. SPECTRUM BS6 PEAK, RANGE AND R EXCEEDANCES

SPECTRUM BS6 PEAK AND RANGE VERSUS R OCCURRENCES FOR 2500 FLIGHT HOURS TABLE 2-8

| TOTAL | 47 | 60 | 201 | 1,373 | 7,026 | 54 | 00 | 00 | 384 | 95 | 4,197 | 34,344 | 36,061 | 26,378 6,028 | 1,565 | 197 | 16 | 9 | 404 044 |
|-----------|--------------------------|---------------------|----------------------|----------------------|----------------------|---------------------|------------------|------------------|------------------|------------------|-------------------|----------------------|----------------------|----------------------|-------|----------------------|----------|----------------------|---------|
| 1.0 | 47 | σ | 201 | 1,373 | 7,026 | 54 | | | | | | i | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| 0.8 | | | | | | | | | | | | 20,693 | 21,502 5,036 | 20,096 | 466 | 7 11 | D. | | |
| 9.0 | | | | | | | | | | 105 | 3,235 | 12,069 8,973 | 13,372 2,993 | 5,824 | 1,051 | 176 | 0 4 | 4 - | |
| 0.4 | | | | | | | | | 64 | 34 | 734 3 | 695 | 406 13 | 201 5 | | 11 | 2 | 2 | |
| 0.2 | | | | | | | | | 84 | 20 4 | 49 | 1088 | 19 | 8 4 | | | | | |
| 0- | | | | | | | | | 73 | 15 | 4 4 | 4 - | - | | | | | | |
| -0.2 | | | | | | | | | 52 45 | 7 | | | | - | 2 | | | | |
| 5 -0.4 | | | | | | | | | 25 24 | D. | | 9 | 93 | 60 | 2 | 2 | | | |
| 3 -0.6 | | | | | | | | | 31 29 | 4 | | 68 5 | 399 321 | 113 | - | - | | | |
| 0. 0.8 | | | | | | | | | 17 | 2 | 1 | 457 | 167 367 | 72 | | | | | |
| -1.2 -1 | | | | | | | | | 28 | | 27 | 238 206 | 2 33 | 4 | | | | | |
| | | | | | | | | | 9 | 2 23 | 300 | 160 | 100 | | | | | | |
| R = -1.4 | | | | | | | | | 65 | 99 | 147 | 3 | | | | | | | |
| PEAK, KSI | -12 TO -11 -11 TO -10 | -10 TO -9 -9 TO8 | -8 TO -7 -7 TO -6 | -6 TO -5 -5 TO -4 | -4 T0 -3 -3 T0 -2 | -2 T0 -1 -1 T0 0 | 0 TO 1 1 TO 2 | 2 TO 3 3 TO 4 | 4 TO 5 5 TO 6 | 6 TO 7 7 TO 8 | 8 TO 9 9 TO 10 | 10 TO 11 11 TO 12 | 12 TO 13 13 TO 14 | 14 TO 15 15 TO 16 | | 18 TO 19 19 TO 20 | T0 T0 | 22 TO 23 23 TO 24 | - |

(Continued on next page.)

SPECTRUM BS6 PEAK AND RANGE VERSUS R OCCURRENCES FOR 2500 FLIGHT HOURS (CONT) TABLE 2-8 (Cont'd)

| RANGE, KSI | R = -1.4 | -1.2 | .2 -1.0 | 00.8 | 8. –0.6 | 6 -0.4 | 1 -0.2 | 0 - | 0.2 | 2 0.4 | 4 0.6 | 6 0.8 | | 1.0 | TOTAL |
|----------------------|-----------|------|-----------|-----------|---------|--------|--------|-----|----------|-------------|-----------------|--------|---|-------------|-----------------|
| 4 TO 5 5 TO 6 | | | | | | | 15 | 28 | 149 | 526 746 | 22,156 | 51,177 | | 922 | 74,958 66,142 |
| 6 TO 7 7 TO 8 | | | | | 20 | 35 | 92 | 10 | 45 | 527 1035 | 19,918 4,636 | 209 | | 4,136 2,063 | 24,930 7,864 |
| 8 TO 9 9 TO 10 | | | 10 | 25 | 31 | 5 | 7 | ε 4 | 17 | 550 382 | 371 | | | 1,350 | 2,346 |
| 10 TO 11 11 TO 12 | 6 | 9 | 18 | 4 | 4 | 5 | | 1 2 | 12 20 | 130 36 | 60 | | | 25 | 273 |
| 12 TO 13 13 TO 14 | 19 | 8 | | 2 | | | | e − | 5 0 | 12 | 1 | | | | 53 20 |
| 14 TO 15 15 TO 16 | 11 10 | 2 | | | | | | | 1 | | | | | | 14 |
| 16 TO 17 17 TO 18 | 11 | 23 | | | | 9 | | | | | | | | | 11 31 |
| 18 TO 19 19 TO 20 | ω m | | 35 | 1 2 | 1 | 36 | | | | | | | | | 85 |
| 20 TO 21 21 TO 22 | 58 148 | 4 | 1 206 | 349 | 429 | 23 | - | | | | | | | | 435 1,113 |
| 22 TO 23 23 TO 24 | 12 | 312 | 149 55 | 120 79 | 344 | 33 | | | | × | | | | | 971 |
| 24 TO 25 25 TO 26 | 12 4 | 26 | 34 | 23 356 | 16 | 9 4 | | | | | | | | | 117 |
| 26 TO 27 27 TO 28 | 2 | 96 | 17 | 70 | | 2 | | | | | | | | | 22 167 |
| 28 TO 29 29 TO 30 | 1 | 4 | 15 4 | 1 | 4 1 | | | | | | | | | | 24 6 |
| 30 TO 31 | | | | | 1 | | | | | | | | | | 1 |
| TOTAL | 364 | 611 | 559 | 1359 | 286 | 289 | 107 | 142 | 362 | 3948 | 006'89 | 025'06 | 0 | 13,446 | 181,644 |

2.3.2 Mission Mix (MM)

Fourteen spectra were generated to represent individual flights as well as mission mixes different from the baseline, with emphasis on training, touch-and-go landings, payloads and time in low-level penetration flying. Together with the baseline spectra, they represent a cross section and possible extremes of the C-15 utilization.

2.3.3 Sequence of Missions (SM)

The question raised here is whether the sequence of missions has an effect on crack growth. The four spectra generated in this category considered ordered sequences on the basis of the largest peak per flight, a different random sequence from that of the baseline and a specific sequence with emphasis on grouping training missions.

2.3.4 Individual Flight Length (FL)

The flight lengths of flights 1A and 1B were varied between flights with no cruise to flights 4.0 hours long. In varying the flight lengths, fuel was also changed to reflect different amounts of fuel burned.

2.3.5 Flight Segments (FS)

The five spectra were generated to study the effect of leaving out landing impact cycles, simplifying the gust spectrum (all climb and all descent flaps up segments equivalenced to one climb and one descent segment by considering average speed and turbulence parameters), or reducing the number of stress transfer functions by using the cruise segment transfer function for climb and descent segments.

2.3.6 Exceedances Spectra (ES)

The number of occurrences or the slope of the maneuver and gust load factor spectra were increased or decreased 15 percent in order to reflect possible variations between individual fleet aircraft.

2.3.7 Design Stress Level (DSL)

All stresses in a given baseline spectrum were increased or decreased by multiplying them by a constant. This variation is viewed as representing design stress changes or reflecting a change in usage severity. It should be noted here that in the loading sequence generation program multiplication of all stresses by a constant is done after the range truncation. Because of this and because the baseline spectrum input range truncation level was retained, the variation spectra truncation levels are different from the baseline spectra by the multiplication constant.

2.3.8 Valley-Peak Coupling (VPC)

All six baseline spectra were regenerated using the alternative (program A6PA) valley-peak coupling method. This method restricts the coupling to cycles with equal incremental load factors above and below $1.0g~(1\pm\Delta~g)$ or to making the 1.0g load the peak or valley of the cycle.

2.3.9 Low Load Truncation (LLT)

Practical cost and time consideration in analysis and testing require elimination of cycles which do not contribute (or contribute very marginally) to crack growth. In this study, elimination of such cycles was investigated as a function of the cycle range, regardless of the R value. Spectra were generated with range truncation (RT) levels of 3000, 3500, 4000 (baseline spectra), 4500 and 5000 psi. In addition, two spectra were generated to investigate the effect of compression-compression (R >1.0) cycles, which in this case were the taxi cycles.

2.3.10 High Infrequent Loads (HIL)

High infrequent tension stresses in a spectrum loading are known to slow down (retard) the crack growth rate at subsequent lower loads. The frequency of occurrence and the magnitude of such loads may significantly vary from aircraft to aircraft or from one time interval to another in the same aircraft. The 10 highest peaks (19,500 to 24,600 psi) in the baseline spectra were chosen as the variables to investigate this effect. The frequency of occurrence and/or the magnitude of these 10 highest peaks were increased as follows: frequency of occurrence to 100 or 200, magnitude to 27,750 psi (80 percent limit) or 33,056 psi (95 percent limit).

2.3.11 Clipping of Large Loads (CLP)

This category of variations is similar to the HIL, except that the magnitude of high infrequent loads was reduced. In the case of tension high infrequent loads, all peaks above 21,531 psi (value of approximately tenth highest load in baseline spectrum) and above 17,942 psi (value of approximately 300th highest load in baseline spectrum) were set to equal these values. To investigate the effect of compression loadings, the baseline spectrum was clipped at zero (no compression loads in the spectrum) and at -5000 psi.

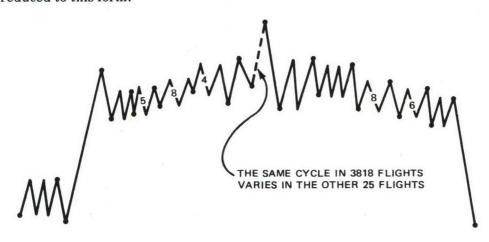
2.3.12 Miscellaneous (MISC)

A number of miscellaneous parameters were investigated in this category: (1) The averaging interval of the maneuver and gust spectra: $\Delta g = 0.05$ and 0.20 versus 0.10 in the baseline spectrum; (2) Spectrum length: shorter spectra than the baseline; (3) Increase of flight 1.0g stresses (14 percent) and decrease of the stress amplitude (10 percent) to simulate the effect of a loads alleviation system; (4) Ignoring of the normal flight segment sequence to study effect of cycles within a flight; (5) Removal of taxi, landing impact and GAG cycles to show the effect of

GAG cycles; and (6) Simplification of a baseline spectrum. This requires more explanation. Sometimes, for practical reasons, it is desired to have a simpler spectrum in place of random cycle-by-cycle spectrum. For this reason, a simplified spectrum (BS6.MISC6) was derived using the following procedures:

- 1. Use the (peak, R) distribution of the random spectrum.
- 2. Retain the peak magnitudes of the 25 highest peaks.
- 3. Average the maneuver and gust lower peak loadings to reduce the number of cycle types to a manageable number. Retain the same number of cycles.
- 4. Calculate one average ground-to-air cycle.
- 5. Calculate an average taxi cycle. Retain the same number of cycles.
- 6. Eliminate landing impact cycles.
- 7. Put the same number of cycles in each "flight," with a "flight" for each landing.
- 8. Order maneuver and gust cycles within a "flight" in a lo-hi-lo sequence according to cycle peak.
- 9. General rules that were followed retain most of the cycles, reduce the number of different loading cycles by averaging, and retain the high infrequent loads without averaging.

The resulting 46-cycle simplified "flight" (3843 such "flights" in the 2500-flight-hour spectrum) was reduced to this form:



A total of 12 types of loading cycles define the spectrum.

2.3.13 Combined (COMB)

Thirteen spectra were generated to study the effect of the following combined variables: valley-peak coupling and range truncation, range truncation and design stress level, high infrequent loads and range truncation, high infrequent loads and design stress level. One other type of spectrum was generated in this category that is distinctly different from all other spectra. These are spectra BS6.COMB11 and BS6.COMB13 which, in a broad sense, have a mean of zero, most cycles have a negative R and can be considered, in its format, to be representative of a vertical tail spectrum.

As a summary of some of the spectra variations, Figure 2-7 schematically shows the different ways that these variations affect the peak load exceedances spectra.

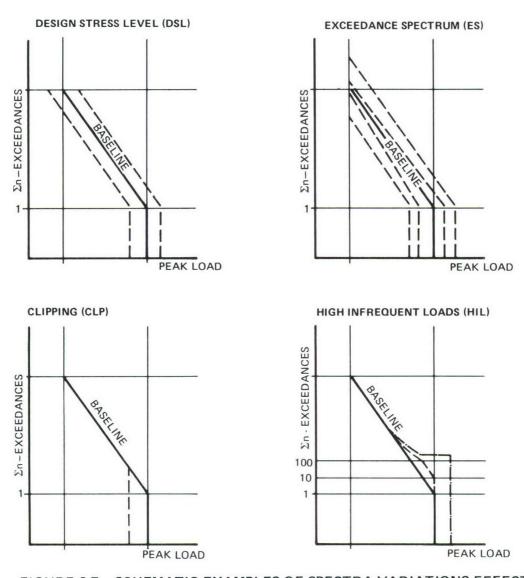


FIGURE 2-7. SCHEMATIC EXAMPLES OF SPECTRA VARIATIONS EFFECT ON PEAK LOADS EXCEEDANCES.

SECTION 3

CRACK GROWTH ANALYSIS

Crack growth analyses were performed on all 116 spectra described in Section 2. The objectives were to establish the effect of spectra variations on crack growth and to produce information to help in the selection of spectra for testing. All analyses were performed to propagate a through-the-thickness 0.03-inch crack, out of one side of a 0.25-inch-diameter open hole in a 9.0-inch-wide panel for 1.0 inch. The spectra, as described in Appendix B, were repeated cycle-by-cycle until 1.0 inch of cracking was attained.

3.1 ANALYSIS METHOD SELECTION

The program plan called for the selection of the analysis method on the basis of a baseline spectrum test results. This selection was to be made before any additional tests were run.

Tests were run on two specimens (A1 and A2) with the composite baseline spectrum BS6. The test results are given in Table C-4. Each specimen had a crack out of an open hole and out of a hole filled with a fastener. Only the crack data out of an open hole were used in the analysis-test correlation to select the analysis method.

Analytical prediction of crack growth rates under spectrum loadings require:

- 1. Knowledge of the spectrum loading sequence.
- 2. Basic crack growth rates under constant amplitude loading for the material in question, in the form of da/dN versus ΔK for various R values.
- 3. Stress intensity factor, K, solution for the crack-specimen geometry in question. K, $psi\sqrt{in.}$, is a function of crack length-specimen geometry and stress.
- 4. Method, model or technique to integrate the above three items and to account for loads interaction effects on crack growth behavior.

Item 1 was developed in this program. Item 2, see Section 3.2, was partly generated in this program, partly obtained from another program. Item 3, the stress intensity factor solution is readily available for the specimen geometry in question, through-crack out of one side of hole in a finite width plate:

$$K = \sigma \sqrt{\pi a \sec\left(\frac{\pi a}{W}\right)} \cdot \beta$$

where

 $\sigma = \text{gross area stress, psi}$

a = crack length, from the edge of hole, in.

W = panel width, in.

 β = Bowie hole correction factor, Reference 2

The relationships between K, σ and a, for the specimen of this program is given in Figure 3-1. The analyses methods under Item 4 can be divided into two groups: the method which does not account for loads interaction effects, hereafter to be referred to as the 'linear' model, and all the other methods, which, by considering yield zone sizes, residual stress fields or crack closure phenomena attempt to account for the loads sequence and interaction effects. These latter methods are summarized in Reference 3. All of these methods primarily concentrate on the so called 'retardation' effect, i.e., slowdown of the crack growth rate at lower loads after the application of a higher load.

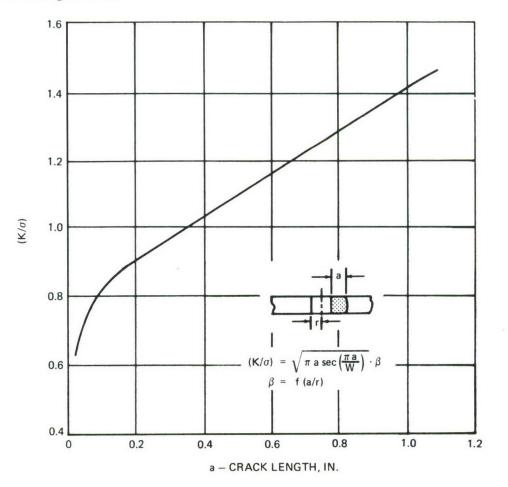


FIGURE 3-1. STRESS INTENSITY FACTOR FOR CRACK OUT OF ONE SIDE OF 1/4-INCH-DIAMETER HOLE, PLATE WIDTH W \geqslant 9.0 IN.

As an initial attempt in correlating analysis and spectrum BS6 test results, the linear and generalized Willenborg (References 4 and 5) models were used. Compression stresses were considered in the calculation of ΔK and R in both analyses. In the crack growth computer program, da/dN data were input in a tabular form, see Paragraph 3.2, for a family of R values. The generalized Willenborg model in the computer program was handled as,

$$\Delta \sigma_{\text{EFF}} = \Delta \sigma$$

$$R_{\text{EFF}} = (\sigma_{\text{MIN}} - \sigma_{\text{RED}}) / (\sigma_{\text{MAX}} - \sigma_{\text{RED}})$$

$$\sigma_{\text{RED}} = \phi (\sigma_{\text{a}_{\text{p}}} - \sigma_{\text{MAX}})$$

$$\phi = [1 - K_{\text{o}} / K_{\text{MAX}})] (1/1.3)$$

$$\sigma_{\text{a}_{\text{p}}} = \frac{\sigma_{\text{y}}}{\beta} \sqrt{\left(\frac{a_{\text{p}} - a}{a}\right) c_{\text{z}}}$$

where

 $\Delta \sigma$ = stress range

 σ_{MIN} = minimum stress

 σ_{MAX} = maximum stress

 $K_o = da/dN$ threshold value at R = 0

 K_{MAX} = maximum stress intensity factor

 σ_{y} = yield stress

 β = correction factor for specimen geometry effect in K calculation

a_p = distance to the end of the preceding higher load plastic zone

a = crack length

 c_z = constant in the calculation of the plastic zone size, $R_y = \frac{1}{c_z \pi} \left(\frac{K_{MAX}}{\sigma_y} \right)^2$

The following values were used in the analysis:

$$K_o = 3 \text{ ksi} \sqrt{\text{in.}}$$

$$\sigma_y = 66.574 \text{ ksi for } 7475\text{-}T7651$$
 $c_z = 4\sqrt{2}$, plain strain condition.

The analyses and test results are compared in Figure 3-2. In general, test results agree well with the linear model analysis, but the generalized Willenborg model predicts much slower crack growth. Note that the analysis represents cracking only on one side of the hole, whereas test results at longer crack length include cracking on the other side. For this reason, and because most of the life is spent in the short crack range, a direct comparison between test and analysis results is made over the first half inch of cracking, a = 0.03 to 0.53 inch:

| | Flight Hours | Test/Analyses |
|--|----------------|---------------|
| Test (average of two tests) Analysis — Linear | 4,118 4,212 | 0.98 |
| Analysis - Generalized Willenborg | 6,600 | 1.57 |

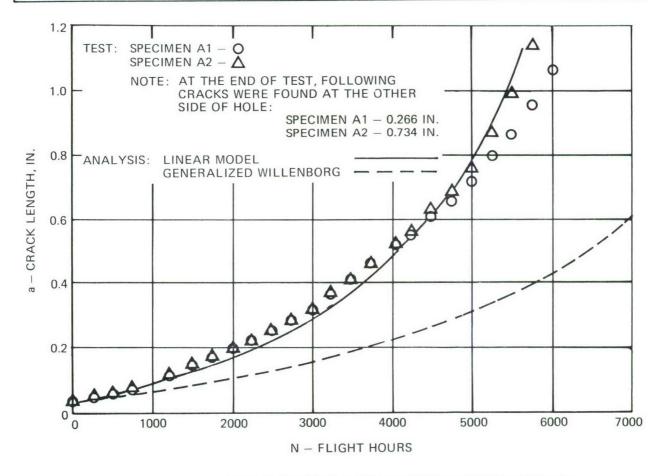


FIGURE 3-2. TEST VERSUS ANALYSIS CRACK GROWTH COMPARISON, OPEN HOLE, SPECTRUM BS6

Any adjustments in the generalized Willenborg model, for the purpose of correlating better with test results, could be accomplished only by removing its retardation features until the model became equivalent to the linear model. As a consequence of this, the linear model was chosen to perform the crack growth analysis of the spectra variations. The reason that the linear model correlates well with the test result is believed to be in the nature of the loading spectrum and the use of good representative da/dN data. The features of the loading spectrum are such that its retardation and acceleration contributions tend to balance each other and produce good correlation with the linear model.

3.2 CRACK GROWTH da/dN DATA

The major portion of the constant amplitude da/dN crack growth data was obtained from Reference 6. These data were obtained on center cracked panels (width = 4 and 12 inches) with a starting total crack length of 0.5 inch. Additional data were generated in this program on specimens with through-the-thickness cracks out of 1/4- or 3/16-inch-diameter open or fastener filled hole. The data were generated to provide a comparison between results from two different types of specimens as well as to obtain data in areas of the spectrum loading not covered by Reference 6. These data are given in Appendix C, Tables C-2 and C-3. The data in Reference 6 and in this program were obtained from specimens made from the same lot and heat of material used to make all other specimens in this program. All of the Reference 6 and open hole data from this program are shown in Figure 3-3. The data from fastener filled holes were not used. The data, as used in a tabular format, in the crack growth computer program are given in Table 3-1.

3.3 CRACK GROWTH ANALYSIS RESULTS

Linear model cycle-by-cycle crack growth analysis results for the 116 spectra are given in Table 3-2. The results are given in terms of life (cycles and flight hours) to propagate the crack from 0.03 to 0.53 and to 1.03 inches. Sample crack growth curves for baseline spectra are shown in Figure 3-4. Evaluation of these results in the light of spectra variations and test results is given in Section 5. However, at this point it is worthwhile to make the following observations about these analysis results:

1. The crack growth life has been presented in terms of cycles and flight hours, because the former is a typical counting parameter in spectra generation and crack growth analysis and the latter is the most common service time parameter kept for each aircraft. Two other parameters could be used to designate the life: flights and landings. A flight is usually associated with one landing, except when a number of touch-and-go landings are performed during training flights. To illustrate the significance of the life parameter when comparing spectra, Figure 3-5 shows the crack growth life in terms of cycles, landings, flights and flight hours for the six baseline spectra. The shortest life is due to spectrum BS3 in three of the four parameters, but if one chose the longest life, four different spectra would be

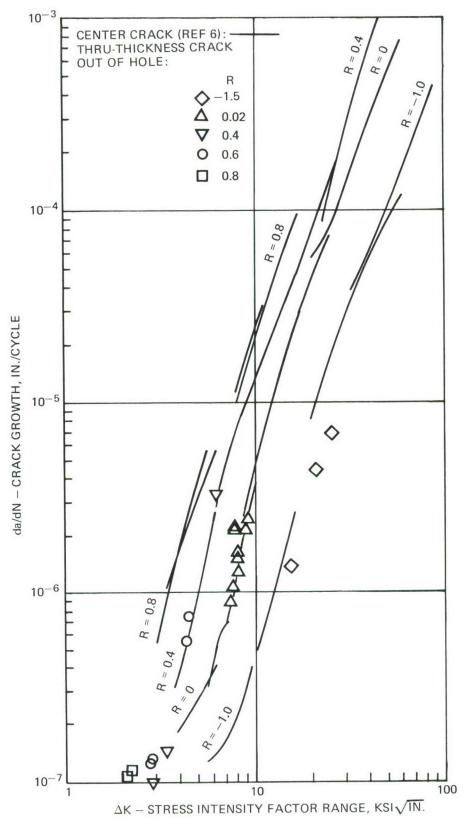


FIGURE 3-3. 7475-T7651 BARE PLATE, t=0.25 IN., da/dN DATA (L-T), ROOM TEMPERATURE AND AIR

CRACK GROWTH da/dN DATA (L-T) USED IN CRACK GROWTH ANALYSIS 7475-T7651 BARE PLATE, t = 0.25 INCH ROOM TEMPERATURE AND AIR

TABLE 3-1

| R | = - 1.5 | | -1.0 | | 0 | | 0.4 | | 0.8 |
|------------|------------------------|------------|-----------------------|------------|-------------------------|------|-------------------------|------|-----------------------|
| ΔK | da/dN | ΔK | da/dN | ΔK | da/dN | ΔΚ | da/dN | ΔΚ | da/dN |
| 1.2* | 1 x 10 ⁻¹⁰ | 1.1* | 1×10^{-10} | 1* | 1 x 10 ⁻¹⁰ | 1.0* | 4×10^{-10} | 1* | 5 x 10 ⁻⁹ |
| 7.15* | 1 x 10 ⁻⁷ | 6* | 1×10^{-7} | 4.2* | 1×10^{-7} | 3.1 | 1 x 10 ⁻⁷ | 2.05 | 1×10^{-7} |
| 7.5* | 1.2×10^{-7} | 7 | 1.65×10^{-7} | 5.0* | 2.2×10^{-7} | 3.4 | 1.7×10^{-7} | 2.2 | 1.2×10^{-7} |
| 8* | 1.5×10^{-7} | 8 | 2.35×10^{-7} | 5.4 | 3.0×10^{-7} | 3.6 | 2.2×10^{-7} | 2.5 | 2.25×10^{-7} |
| 9* | 2.1×10^{-7} | 9 | 3.4×10^{-7} | 5.8 | 3.8×10^{-7} | 3.8 | 3.0×10^{-7} | 2.75 | 3.3×10^{-7} |
| 10* | 3.1×10^{-7} | 10 | 4.6×10^{-7} | 6 | 4.5×10^{-7} | 3.9 | 3.4×10^{-7} | 3.0 | 5.0×10^{-7} |
| 12* | 5.3×10^{-7} | 12 | 8.5×10^{-7} | 7 | 7.2×10^{-7} | 4.0 | 4.0×10^{-7} | 3.5 | 9.5×10^{-7} |
| 15 | 1.2×10^{-6} | 14 | 1.7×10^{-6} | 8 | 1.45 x 10 ⁻⁶ | 4.5 | 5.8 x 10 ⁻⁷ | 4.0 | 1.7×10^{-6} |
| 18 | 2.5×10^{-6} | 17 | 4.3×10^{-6} | 9 | 2.9×10^{-6} | 5.0 | 1.1×10^{-6} | 4.5 | 2.7×10^{-6} |
| 20 | 3.6×10^{-6} | 20 | 8.7×10^{-6} | 10 | 4.6×10^{-6} | 6.0 | 2.45×10^{-6} | 5.0 | 4.0×10^{-6} |
| 25 | 6.6×10^{-6} | 25 | 1.65×10^{-5} | 12 | 9.2×10^{-6} | 7.0 | 4.9×10^{-6} | 6.0 | 7×10^{-6} |
| 30* | 1.1 x 10 ⁻⁵ | 30 | 2.65×10^{-5} | 14 | 1.55 x 10 ⁻⁵ | 8.0 | 7.7×10^{-6} | 7.0 | 1.05×10^{-5} |
| 35* | 1.6 x 10 ⁻⁵ | 40 | 5.6×10^{-5} | 17 | 2.8×10^{-5} | 9.0 | 1.02 x 10 ⁻⁵ | 8.0 | 1.48×10^{-5} |
| 40* | 2.3 x 10 ⁻⁵ | 50 | 9.7×10^{-5} | 20 | 4.3×10^{-5} | 10.0 | 1.3×10^{-5} | 9.0 | 1.95×10^{-5} |
| 50* | 4.0×10^{-5} | 60 | 1.62×10^{-4} | 25 | 7.7×10^{-5} | 12.0 | 2.1×10^{-5} | 10.0 | 2.55×10^{-5} |
| 60* | 6.5 x 10 ⁻⁵ | 70 | 2.45×10^{-4} | 30 | 1.25×10^{-4} | 14.0 | 3.0 x 10 ⁵ | 12.0 | 4.0×10^{-5} |
| 70* | 9.5×10^{-5} | 80 | 3.5×10^{-4} | 40 | 2.8 x 10-4 | 17.0 | 4.9×10^{-5} | 14.0 | 5.7×10^{-5} |
| 80* | 1.4 x 10 ⁻⁴ | 90 | 4.7×10^{-4} | 50 | 5.0×10^{-4} | 20.0 | 7.5 x 10 ⁵ | 17.0 | 1.3×10^{-4} |
| 100* | 2.4×10^{-4} | 100 | 6.2×10^{-4} | 60 | 7.7×10^{-4} | 25.0 | 1.45×10^{-4} | 20 | 2.9×10^{-4} |
| 400* | 1 x 10 ⁻² | 300* | 1×10^{-2} | 150* | 1×10^{-2} | 100* | 1 x 10 ⁻² | 44* | 1×10^{-2} |

R = STRESS RATIO = $\sigma_{\rm MIN}/\sigma_{\rm MAX}$ $\Delta {\rm K}$ = STRESS INTENSITY FACTOR, KSI $\sqrt{{\rm IN.}}$

da/dN = CRACK GROWTH UNDER CONSTANT AMPLITUDE LOADING, IN./CYCLE

^{*}EXTRAPOLATED FOR ANALYSIS INTERPOLATION.

TABLE 3-2
LINEAR CRACK GROWTH ANALYSIS RESULTS

| | | | LIFE TO PROPAGA | ATE THE CRACI | < |
|-----|----------------|---------|-----------------|---------------|---------------|
| | SPECTRUM | a = 0.0 | 03 → 0.53 IN. | a = 0.0 | 03 → 1.03 IN. |
| NO. | IDENTIFICATION | CYCLES | FLIGHT HOURS | CYCLES | FLIGHT HOURS |
| 1 | BS1 | 297,818 | 16,255 | 394,089 | 21,510 |
| 2 | BS2 | 326,737 | 78,347 | 427,922 | 102,724 |
| 3 | BS3 | 292,031 | 1,124 | 380,441 | 1,465 |
| 4 | BS4 | 279,968 | 3,518 | 371,009 | 4,662 |
| 5 | BS5 | 640,722 | 8,124 | 803,133 | 10,183 |
| 6 | BS6 | 306,065 | 4,212 | 400,112 | 5,506 |
| 7 | BS1.MM1A | 668,178 | 33,719 | 868,471 | 43,827 |
| 8 | BS1.MM1B | 193,365 | 11,670 | 257,307 | 15,529 |
| 9 | BS3.MM3A | 429,535 | 1,097 | 550,754 | 1,406 |
| 10 | BS3.MM3B | 205,707 | 1,138 | 270,095 | 1,505 |
| 11 | BS4.MM4A | 361,558 | 4,812 | 475,963 | 6,335 |
| 12 | BS4.MM4B | 190,352 | 1,992 | 253,304 | 2,651 |
| 13 | BS45.MM7 | 376,834 | 4,751 | 489,614 | 6,173 |
| 14 | BS4.MM8 | 298,901 | 3,011 | 393,976 | 3,969 |
| 15 | BS123.MM9 | 290,952 | 4,095 | 380,640 | 5,357 |
| 16 | BS6.MM10 | 318,706 | 3,711 | 418,382 | 4,872 |
| 17 | BS13.MM11 | 440,852 | 2,604 | 563,232 | 3,326 |
| 18 | BS123.MM12 | 209,223 | 4,957 | 276,094 | 6,542 |
| 19 | BS6.MM13 | 300,616 | 14,457 | 396,231 | 19,055 |
| 20 | BS6.MM14 | 311,607 | 2,504 | 406,660 | 3,268 |
| 21 | BS1.SM1 | 297,691 | 16,266 | 392,661 | 21,456 |
| 22 | BS6.SM1 | 294,375 | 4,051 | 415,950 | 5,723 |
| 23 | BS6.SM4 | 308,886 | 4,245 | 402,912 | 5,537 |
| 24 | BS6.SM5 | 307,535 | 4,226 | 399,983 | 5,496 |
| 25 | BS1A.FL1 | 602,934 | 17,632 | 785,714 | 22,977 |
| 26 | BS1A.FL2 | 682,528 | 62,048 | 881,738 | 80,158 |
| 27 | BS1A.FL3 | 595,874 | 90,284 | 770,933 | 116,808 |
| 28 | BS1B.FL1 | 192,211 | 7,005 | 255,906 | 9,327 |
| 29 | BS1B.FL2 | 216,932 | 19,902 | 287,738 | 26,398 |
| 30 | BS1B.FL3 | 201,480 | 27,600 | 270,538 | 37,060 |
| 31 | BS6.FS1 | 305,102 | 4,217 | 399,186 | 5,517 |
| 32 | BS6.FS2 | 307,768 | 4,262 | 401,439 | 5,559 |
| 33 | BS1.FS3 | 294,397 | 18,475 | 390,974 | 24,535 |
| 34 | BS1.FS4 | 290,934 | 16,021 | 384,667 | 21,182 |
| 35 | BS1.FS5 | 319,041 | 17,569 | 420,623 | 23,163 |
| 36 | BS6.ES1 | 307,381 | 3,728 | 402,778 | 4,884 |
| 37 | BS6.ES2 | 305,045 | 4,843 | 397,995 | 6,319 |
| 38 | BS6.ES3 | 282,909 | 2,760 | 368,501 | 3,594 |
| 39 | BS6.ES4 | 329,267 | 7,006 | 430,729 | 9,165 |

TABLE 3-2 (Continued)

LINEAR CRACK GROWTH ANALYSIS RESULTS

| | | | LIFE TO PROPAG | ATE THE CRAC | СК |
|-----|----------------|-----------|----------------|--------------|--------------|
| | SPECTRUM | a = 0.0 | 03 → 0.53 IN. | a = 0.0 | 3 → 1.03 IN. |
| NO. | IDENTIFICATION | CYCLES | FLIGHT HOURS | CYCLES | FLIGHT HOURS |
| 40 | BS1.DSL1 | 177,217 | 9,683 | 240,169 | 13,123 |
| 41 | BS3. | 169,672 | 653 | 228,092 | 878 |
| 42 | BS4. | 166,848 | 2,096 | 227,072 | 2,853 |
| 43 | BS6. | 178,800 | 2,460 | 239,100 | 3,290 |
| 44 | BS1.DSL2 | 454,563 | 24,838 | 589,318 | 32,201 |
| 45 | BS3. | 450,977 | 1,736 | 577,850 | 2,225 |
| 46 | BS4. | 428,096 | 5,378 | 555,584 | 6,980 |
| 47 | BS6. | 473,550 | 6,516 | 607,425 | 8,358 |
| 48 | BS6.DSL3 | 1,120,050 | 15,412 | 1,396,125 | 19,211 |
| 49 | BS6.DSL4 | 99,750 | 1,373 | 139,350 | 1,917 |
| 50 | BS1.VPC1 | 263,306 | 15,501 | 351,691 | 20,704 |
| 51 | BS2. | 257,368 | 72,942 | 341,279 | 96,724 |
| 52 | BS3. | 159,144 | 1,024 | 214,472 | 1,380 |
| 53 | BS4. | 268,066 | 3,362 | 356,332 | 4,469 |
| 54 | BS5. | 580,223 | 6,330 | 730,802 | 7,972 |
| 55 | BS6. | 204,448 | 3,843 | 274,775 | 5,165 |
| 56 | BS1.LLT1 | 259,459 | 16,449 | 345,088 | 21,878 |
| 57 | BS3. | 223,041 | 1,199 | 293,020 | 1,575 |
| 58 | BS4. | 232,024 | 3,587 | 309,920 | 4,792 |
| 59 | BS6. | 233,226 | 4,457 | 308,178 | 5,890 |
| 60 | BS1.LLT2 | 461,746 | 14,008 | 601,600 | 18,251 |
| 61 | BS3. | 403,884 | 864 | 520,521 | 1,113 |
| 62 | BS4. | 429,638 | 3,070 | 561,150 | 4,010 |
| 63 | BS6. | 418,268 | 3,359 | 539,700 | 4,334 |
| 64 | BS1.LLT3 | 559,930 | 14,573 | 725,724 | 18,888 |
| 65 | BS3. | 511,373 | 810 | 656,818 | 1,040 |
| 66 | BS4. | 519,960 | 3,106 | 675,692 | 4,036 |
| 67 | BS6. | 538,038 | 3,162 | 695,025 | 4,085 |
| 68 | BS6.LLT4 | 284,455 | 4,218 | 371,942 | 5,515 |
| 69 | BS6.LLT5 | 451,673 | 4,213 | 589,986 | 5,503 |
| 70 | BS3.LLT4 | 222,663 | 1,198 | 292,581 | 1,574 |
| 71 | BS6.LLT6 | 215,724 | 4,589 | 285,966 | 6,084 |
| 72 | BS1.HIL1 | 291,983 | 15,867 | 386,877 | 21,023 |
| 73 | .HIL2 | 284,539 | 15,462 | 377,450 | 20,511 |
| 74 | .HIL3 | 294,722 | 16,104 | 390,037 | 21,312 |
| 75 | HIL4 | 296,188 | 16,184 | 392,155 | 21,428 |
| 76 | BS3.HIL1 | 291,313 | 1,121 | 379,648 | 1,461 |
| 77 | BS3.HIL2 | 290,424 | 1,117 | 378,631 | 1,457 |

TABLE 3-2 (Continued)

LINEAR CRACK GROWTH ANALYSIS RESULTS

| | | | LIFE TO PROPAG | ATE THE CRAC | :K |
|-----|----------------|---------|----------------|--------------|----------------|
| | SPECTRUM | a = 0. | 03 → 0.53 IN. | a = 0. | .03 → 1.03 IN. |
| NO. | IDENTIFICATION | CYCLES | FLIGHT HOURS | CYCLES | FLIGHT HOURS |
| 78 | BS3.HIL3 | 291,846 | 1,124 | 380,111 | 1,464 |
| 79 | BS3.HIL4 | 291,973 | 1,124 | 380,238 | 1,464 |
| 80 | BS6.HIL1 | 304,500 | 4,190 | 397,725 | 5,473 |
| 81 | HIL2 | 302,578 | 4,158 | 395,702 | 5,438 |
| 82 | .HIL3 | 305,700 | 4,206 | 399,300 | 5,494 |
| 83 | HIL4 | 305,925 | 4,210 | 399,900 | 5,503 |
| 84 | BS1.HIL5 | 242,269 | 13,238 | 323,664 | 17,685 |
| 85 | BS1.HIL6 | 263,409 | 14,393 | 350,887 | 19,173 |
| 86 | BS3.HIL5 | 286,176 | 1,102 | 373,439 | 1,438 |
| 87 | BS3.HIL6 | 291,765 | 1,123 | 380,044 | 1,463 |
| 88 | BS6.HIL5 | 290,971 | 4,000 | 382,632 | 5,260 |
| 89 | BS6.HIL6 | 304,500 | 4,190 | 389,700 | 5,362 |
| 90 | BS6.CLP1 | 306,075 | 4,212 | 400,125 | 5,506 |
| 91 | .CLP2 | 306,450 | 4,217 | 400,875 | 5,516 |
| 92 | .CLP3 | 299,754 | 4,451 | 390,590 | 5,800 |
| 93 | .CLP4 | 306,422 | 4,302 | 397,929 | 5,587 |
| 94 | BS6.MISC1 | 306,121 | 4,229 | 399,794 | 5,523 |
| 95 | 2 | 327,627 | 2,179 | 427,886 | 2,845 |
| 96 | 3 | 310,386 | 4,239 | 404,909 | 5,530 |
| 97 | 4 | 308,100 | 4,248 | 402,075 | 5,543 |
| 98 | 5 | 307,125 | 4,222 | 401,250 | 5,516 |
| 99 | 6 | 355,672 | 5,029 | 461,150 | 6,520 |
| 100 | BS1.MISC7 | 260,230 | 15,393 | 348,679 | 20,625 |
| 101 | BS3.MISC8 | 287,562 | 1,127 | 375,803 | 1,472 |
| 102 | BS1.MISC9 | 288,495 | 12,721 | 380,480 | 16,776 |
| 103 | BS6.MISC10 | 318,556 | 4,848 | 411,607 | 6,264 |
| 104 | BS6.COMB1 | 341,267 | 2,990 | 447,640 | 3,922 |
| 105 | 2 | 461,753 | 2,830 | 598,999 | 3,671 |
| 106 | 3 | 236,587 | 1,900 | 318,062 | 2,554 |
| 107 | 4 | 305,702 | 1,797 | 404,911 | 2,380 |
| 108 | 5 | 359,428 | 6,874 | 463,085 | 8,857 |
| 109 | 6 | 655,015 | 5,260 | 830,689 | 6,671 |
| 110 | 7 | 400,823 | 3,219 | 520,980 | 4,184 |
| 111 | 8 | 409,176 | 3,286 | 528,305 | 4,248 |
| 112 | 9 | 175,950 | 2,421 | 234,900 | 3,232 |
| 113 | 10 | 987,225 | 13,584 | 1,242,600 | 17,098 |
| 114 | 11 | 620,465 | 9,584 | 813,612 | 12,568 |
| 115 | 12 | 416,502 | 3,344 | 537,082 | 4,312 |
| 116 | 13 | 206,376 | 3,188 | 273,052 | 4,218 |
| 110 | 7 7 13 | 200,370 | 3,100 | 275,052 | 4,210 |

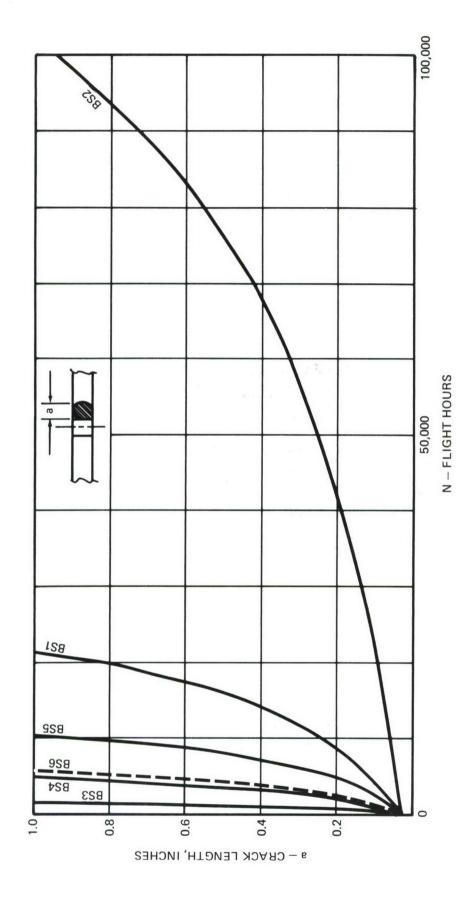


FIGURE 3-4. LINEAR ANALYSIS CRACK GROWTH CURVES FOR BASELINE SPECTRA

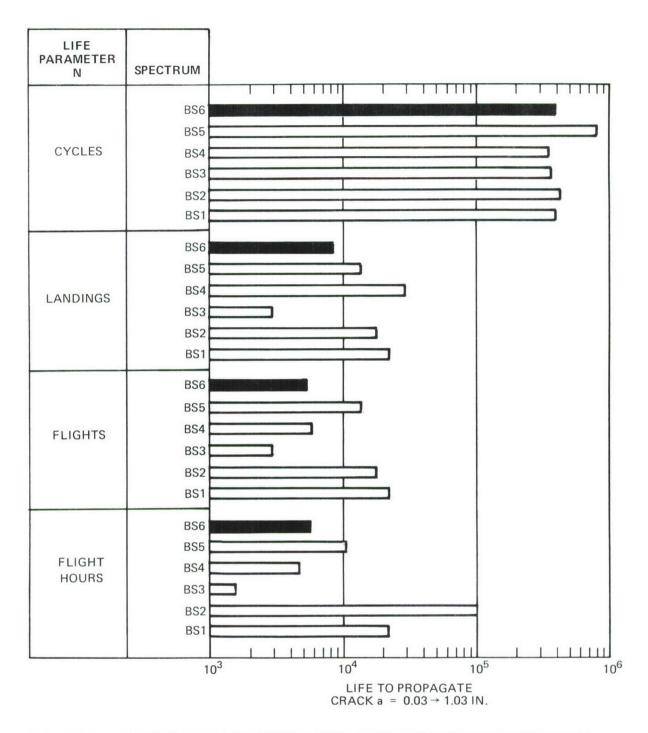


FIGURE 3-5. LINEAR ANALYSIS CRACK GROWTH LIFE FOR BASELINE SPECTRA IN TERMS OF DIFFERENT LIFE PARAMETERS

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chosen, depending on the life parameter: BS5-cycles, BS4-landings, BS1-flights, BS2-flight hours. Throughout the report, flight hours are used as the primary life parameter. Conversion to any other parameter can be performed using information given for each spectrum in Appendix B.

- 2. The crack growth curves, a versus N, see Figures 3-2 and 3-4, are smooth curves for all spectra. Because of this, the ratio of life to propagate the crack 1/2 inch to the life to propagate the crack 1 inch is fairly constant for all spectra. The ratio varies between 0.74 and 0.78 for 93 percent of the spectra, with the smallest value being 0.71 and the largest 0.80. Such consistency implies that different spectra crack growth comparison will show the same trends whether the comparison is made after 1/2 or 1 inch of cracking.
- 3. The crack growth per flight varies with flight type and crack length. As an example, crack growth rates per flight, for the eight difference flight types, at a = 0.03 inch, are:

| Flight | Cycles/Flight | da/dF |
|--------|---------------|-----------------------|
| 1a | 15 | 3.45×10^{-6} |
| 1b | 13 | 1.15×10^{-5} |
| 2 | 24 | 1.25×10^{-5} |
| 3a | 84 | 6.10×10^{-5} |
| 3b | 88 | 6.76×10^{-5} |
| 4a | 63 | 2.62×10^{-5} |
| 4b | 54 | 4.14×10^{-5} |
| 5 | 58 | 1.50×10^{-5} |

The crack growth rate per flight also varies even for the same flight type, because the number of cycles per flight and their magnitude vary from flight to flight. For example, for flight type 2, starting at a = 0.03 inch, the variation for 10 flights is as follows:

| Cycles/Flight | da/dF |
|---------------|-----------------------|
| 25 | 1.25×10^{-5} |
| 30 | 1.20×10^{-5} |
| 19 | 8.51×10^{-6} |
| 31 | 1.24×10^{-5} |
| 27 | 1.07×10^{-5} |
| 19 | 9.29×10^{-6} |
| 25 | 1.28×10^{-5} |
| 17 | 7.74×10^{-6} |
| 19 | 1.08×10^{-5} |
| 20 | 1.12×10^{-5} |

4. The wing spectrum has significant cycle once per flight, the ground-air-ground (GAG) cycle associated with each takeoff and landing. The contribution of this cycle to the total crack growth per flight varies with flight type and crack length. For example, at a = 0.03 inch, one GAG cycle contributes anywhere from 5 to 50 percent of the total crack growth per flight for the eight different flights. This percentage decreases with crack growth, i.e., at longer cracks the contribution of the other cycles becomes more significant.

SECTION 4

EXPERIMENTAL PROGRAM

The experimental program consisted of tests on 7475-T7651 aluminum alloy bare plate, 0.25 inch thick, taken from the same lot and heat. The tests can be divided into three parts:

- 1. Material characterization tests: static strength, material chemical analysis, fracture toughness and constant amplitude loading crack growth da/dN. Fracture toughness and some of the da/dN data were obtained from another program, Reference 6.
- 2. Baseline spectra and spectra variation crack growth tests. Thirty-five specimens.
- Tests to study the effect of sustained compression loading on crack growth under spectrum loading. Five specimens.

All experimental data, except those obtained from Reference 6, are presented in Appendix C.

4.1 MATERIAL CHARACTERIZATION

Chemical analysis and tensile static strength results are given in Table C-1. The chemical analysis results met all specification values for the material. Material tensile static strength properties (L), average of three specimens, are:

Fracture toughness, K_C values, for two different panel widths (W = 4 and 12 inches) were calculated from test results of center cracked panels, where

$$K_c = \sigma \sqrt{\pi a \sec{(\frac{\pi a}{W})}}$$

The total crack lengths at fast fracture, averages of four tests each, and the $K_{\mbox{\scriptsize C}}$ values were

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$$W = 4.0 \text{ in.}$$
 $2a = 1.52 \text{ in.}$ $K_c = 70.55 \text{ KSI}\sqrt{\text{in.}}$ $W = 12.0 \text{ in.}$ $2a = 2.09 \text{ in.}$ $K_c = 113.92 \text{ KSI}\sqrt{\text{in.}}$

The constant amplitude loading da/dN data are reported in Tables C-2 and C-3 of Appendix C. Data were obtained from eight specimens, although only one specimen was entirely devoted to generate da/dN data. Other data were either generated on specimens with previous spectrum loading or the data were taken directly from precracking results. The specimens were from 9 to 11.5 inches wide. The crack was a thru-the-thickness crack out of one side of a 1/4- or 3/16-inch-diameter open or a fastener-filled hole. Further discussion of the use of these data in the crack growth analysis is to be found in Section 3.2.

4.2 BASELINE SPECTRA AND SPECTRA VARIATIONS CRACK GROWTH TESTS

Thirty-five specimens were tested under 33 different loading spectra. The results are given in Appendix C, Tables C-4 through C-35 and are summarized in Table 5-1.

4.2.1 Specimen

The specimen used in this series of tests is defined in Figure 4-1: 9.0 inches wide with two 1/4-inch diameter holes with a 0.03-inch through-the-thickness crack on one side of each hole. The initial crack length of 0.03 inch was chosen, through preliminary analysis, to produce approximately 1.0 inch of cracking in 5000 flight hours of baseline spectrum BS6 (two applications of the 2500- flight-hour spectrum). As can be seen from test results, Figure 3-2, the estimate was fairly accurate. It took approximately 5700 flight hours, over two repetitions of the spectrum, to propagate the crack 1.0 inch. The objective of two repetitions of the spectrum was to produce loads interaction effects of the loads at the end of the spectrum on the loads at the beginning of the spectrum. This objective, i.e., repetition of the spectrum more than twice, was attained in most tests (see Appendix C), the major exception being spectrum BS3 and its variations requiring less than a complete spectrum to propagate the crack 1.0 inch.

The 0.03-inch crack was developed as follows. A 0.014-inch notch was produced by a special broach on one side of a 3/16-inch pilot hole. A fatigue crack was initiated in this notch and was propagated to a 0.04725-inch length under constant amplitude loading of $S_{\rm max}=12,000$ psi and R=0.02. The peak value of this loading was chosen to be a magnitude which was typically encountered in the first few flights of any given spectrum so as to minimize the effect of this loading on the subsequent crack growth under spectrum loading. Between 30,000 and 40,000 cycles were needed to attain this precrack, the small scatter indicating that the broach-produced notch is highly identically reproducible. This is also reflected in the fact that when the required precrack length was reached in one hole, in most specimens, the crack length in the other hole was not far behind. All specimens were polished and scribed on one side in the area of expected crack growth in order to facilitate crack length measurement. Scribe marks were 0.1 inch apart, the field of vision of the optical measurement instrument.

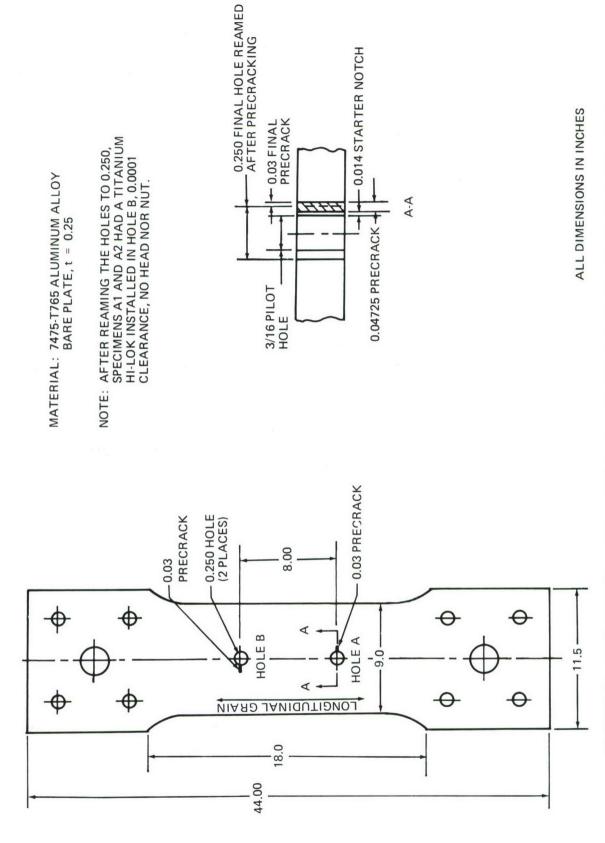


FIGURE 4-1. BASELINE SPECTRA AND SPECTRA VARIATIONS CRACK GROWTH TEST SPECIMEN

4.2.2 Testing System

The specimens were tested in a Douglas-designed testing system consisting of a 1.5-million-pound test fixture with five individually controlled 150,000-pound capacity jacks using closed-loop electrohydraulic servosystems. The system allows for testing up to five specimens simultaneously under five different loading spectra. The loading spectra, in terms of valley and peak sequences, were input into the testing system from a magnetic tape through an SEL 810A computer. The testing system, with five specimens, is illustrated in Figure 4-2.

4.2.3 Testing Procedures

The specimens were tested most of the time in groups of five. Antibuckling plates, seen in Figure 4-2, were used to prevent buckling under compression loads. The loads were applied at 4.0 Hz frequency. The loads accuracy was spot-checked through a strip chart recorder trace and monitored automatically through the computer with respect to a preset tolerance level. The tolerance level was set at ± 3500 pounds (± 1556 psi). In terms of baseline spectrum BS6 largest peak and valley, this tolerance represents ± 6.5 -percent accuracy. A sampling of a group of five specimens over four million cycles showed one out-of-tolerance load every 40,000 reversals with almost half of the out-of-tolerances occurring at the infrequent higher tension or compression loads.

The test duration was established as time to propagate the crack 1.0 inch, unless the crack growth rate was so low as to indicate a test duration significantly longer than 5.0×10^5 cycles. In that case the test was to terminate after 0.5 inch of cracking. In almost all tests at least 0.5 inch of crack growth was attained, and in most 1.0 inch, with an average test duration of 5.3×10^5 cycles. (See Appendix C.)

Surface crack lengths, on one side of specimen, were measured approximately at least 20 times per test at equal cycle intervals. In a typical test a crack length measurement was made at least every 0.05 inch of crack growth. The measurements were made with a 40X optical microscope within an accuracy of 0.001 inch.

4.2.4 Spectra Selection for Testing

The 33 spectra selected for testing, out of the 116 spectra generated, are identified in Tables 2-5 and 2-6. First, the six baseline spectra were chosen as the basic reference spectra for all the variations. The other spectra were selected, within the size of this test program, on the basis of the linear crack growth analysis (Table 3-2) indicating a large crack growth variation from the baseline spectra or on the basis that no variation was indicated but the analysis accuracy was suspect. Another consideration in the selection was to adequately cover the spectrum variables considered in developing the 116 spectra.

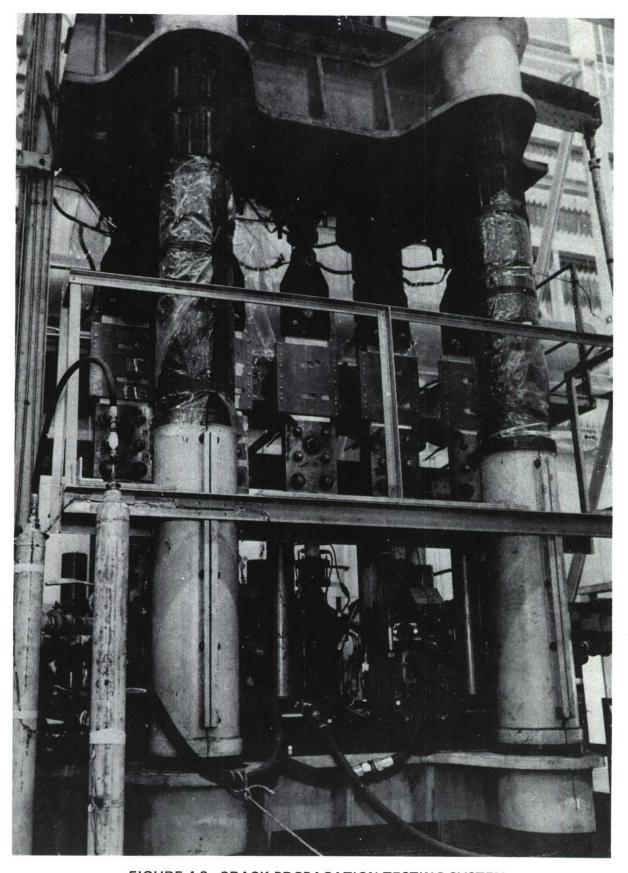


FIGURE 4-2. CRACK PROPAGATION TESTING SYSTEM

4.2.5 Test Results

The test results are presented in Appendix C. The significance of these test results with respect to analysis predictions and spectra variations is discussed in Section 5. A photograph of the fracture surfaces of some of the specimens is presented in Figure 4-3. Note the precrack on the left side of the hole and the different amount of cracking on the right side.

4.3 SUSTAINED COMPRESSION LOADING TESTS

Five tests were performed to check the effects of sustained compression loading (SCL) on crack growth under spectrum loading. The tests results are given in Table C-36.

4.3.1 Specimen

The test specimen is defined in Figure 4-4: 11.0-inch-wide panel with two 1/4-inch-diameter holes with a 0.125-inch thru-the-thickness crack on one side of each hole as well as a 0.125-inch thru-the-thickness crack at specimen's edge. One of the holes was filled with a neat fit (0.0001 to 0.0002 inch clearance) Hilok titanium fastener. The purpose of an edge crack and a crack out of a fastener-filled hole, as opposed to a crack out of an open hole, was to check the effect of SCL under different compression loading transfer paths.

Precracking was done at constant amplitude loading of $S_{max} = 10,000$ psi and R = 0.02. Precracking was terminated when the crack at hole B reached the required length, accepting whatever the crack length was at hole A or edge.

4.3.2 Testing System

With one addition, the same system as described in Section 4.2.2 was used for these tests. The addition was an inactive weight induced hydraulic system for the application of the SCL.

4.3.3 Loads Spectrum

The loads spectrum was based on a preliminary version of Flight 1b. The spectrum, representing 200 flight hours and flights, is summarized in Table 4-1. The spectrum, in the form of a random cycle-by-cycle sequence, was developed by the same method as used throughout this program, see Section 2.

4.3.4 Testing Procedures

Five specimens, F1 through F5, were tested, two (F1 and F2) with SCL, the other three without SCL. Before the application of the spectrum loading, the cracks were further precracked under constant amplitude loading of $S_{max}=13{,}091$ psi and R=0.02. This loading was applied until the crack at hole B reached 0.140 inch. At this stage, cracks at hole A and edge varied anywhere from no cracks to a 0.264-inch edge crack in specimen F1.

| \! _e | | | | | | | | | | | | | | |
|-----------------|-----|-----|-----|---------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|------------|
| HOLE | ۷ | ∢ | ∢ | ω | 8 | ∢ | ∢ | m | В | ∢ | ∢ | В | æ | ω |
| SPECIM | A2 | C2 | C4 | C7 | D17 | D3 | D13 | 83 | 60 | D19 | 60 | D10 | D11 | D21 |
| SPECTRUM | BS6 | BS2 | BS4 | BS4.MM8 | BS6.DSL3 | BS6.DSL4 | BS6.LLT2 | BS6.HIL1 | BS6.HIL4 | BS6.HIL5 | BS6.CLP3 | BS6.MISC6 | BS6.COMB3 | BS6.COMB11 |

FIGURE 4-3. SPECTRA VARIATIONS CRACK GROWTH TEST SPECIMEN FRACTURE SURFACES

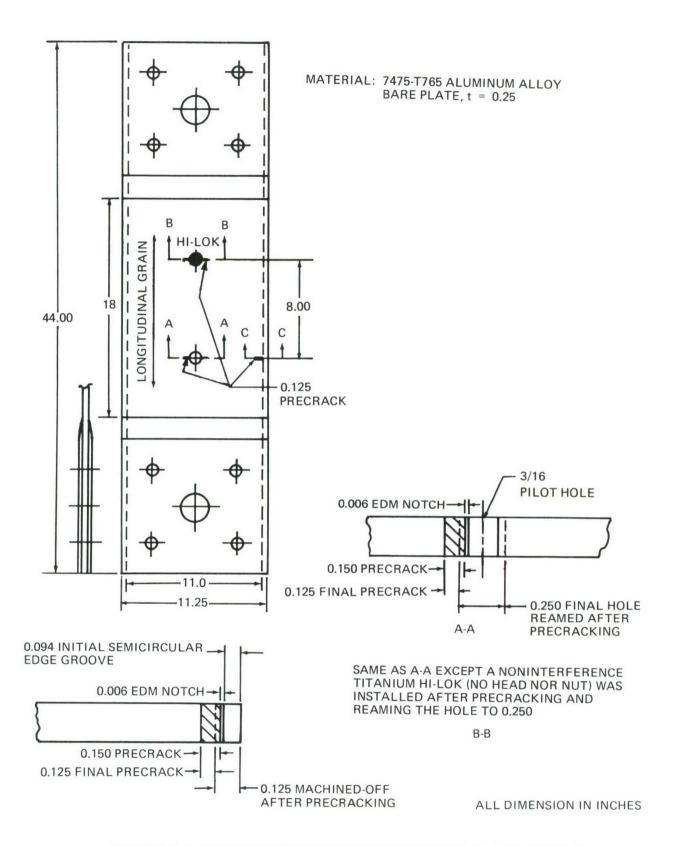


FIGURE 4-4. CRACK GROWTH TEST SPECIMEN FOR CHECKING THE EFFECT OF SUSTAINED COMPRESSION LOADING

TABLE 4-1

SPECTRUM F SUMMARY

DESCRIPTION — SPECTRUM FOR SUSTAINED COMPRESSION LOADING EFFECT TEST BASED ON PRELIMINARY VERSION OF FLIGHT 1B.

FLIGHT HOURS = 200 FLIGHTS = 200 LANDINGS = 200 TOTAL CYCLES = 5,478 AVERAGE NO. OF CYCLES PER: FLIGHT = 27.4 RANGE TRUNCATION (PSI) = 3,000 FLIGHT HOUR = 27.4 HIGHEST PEAK (PSI) = 22,476 SMALLEST VALLEY (PSI) = -10,592

| PEAK DISTRI | BUTION | RANGE DISTRI | BUTION | R DISTR | IBUTION |
|-------------|--------|--------------|--------|---------|---------|
| PEAK (PSI) | n | RANGE (PSI) | n | R | n |
| -6,969 | 245 | 3,040 | 1400 | -0.9 | T . |
| -5,938 | 345 | 4,080 | 4139 | -0.8 | 5 |
| -4,906 | 777 | 5,120 | 828 | -0.7 | 23 |
| | 479 | | 64 | | 150 |
| -3,875 | 78 | 6,160 | 143 | -0.6 | 22 |
| -2,844 | 1 | 7,200 | 57 | -0.5 | 0 |
| -1,813 | 0 | 8,240 | 22 | 0 | |
| 8,500 | | 9,280 | | 0.1 | 3 |
| 9,531 | 1 | 10,320 | 14 | 0.2 | 3 |
| 10,563 | 0 | 11,360 | 5 | 0.3 | 7 |
| | 30 | | 4 | | 20 |
| 11,594 | 1386 | 12,400 | 1 | 0.4 | 45 |
| 12,625 | 990 | 13,440 | 0 | 0.5 | 157 |
| 13,656 | | 14,480 | | 0.6 | |
| 14,688 | 917 | 15,520 | 1 | 0.7 | 621 |
| 15,719 | 347 | 18,640 | 0 | 0.8 | 2682 |
| 16,750 | 68 | | 21 | | 60 |
| | 41 | 19,680 | 5 | 0.9 | 0 |
| 17,781 | 8 | 20,720 | 124 | > 1.0 | 1680 |
| 18,813 | 0 | 21,700 | | | |
| 19,844 | | 22,800 | 37 | | |
| 20,875 | 6 | 23,840 | 5 | | |
| 21,906 | 2 | 24,880 | 7 | | |
| | 2 | | 1 | | |
| 22,938 | | 25,920 | | | |

The spectrum loading was applied, at 4 Hz, to all five specimens 20 times for a total loading representing 4000 flight hours and flights. However, in the first application of flight No. 51, the largest peak in the flight was increased from 14,887 to 27,750 psi. This was done to produce a relatively large plastic zone for possible interaction with the SCL.

The duration of testing with the SCL on specimens F1 and F2 was 344 hours or approximately 2 weeks. The sustained compression load of -7305 psi, representing preflight ground 1.0g stress, was applied for 1.5 hours every 200 flights, after flight No. 12, as well as after flight No. 51 first time only. This SCL was also applied during nights and weekends for a total time of 297 hours.

Back-to-back strain gages were installed on specimens F1 and F2 to determine if there was any significant bending under the SCL. No such bending was observed and the stresses were the same on both sides of specimen.

Antibuckling plates, shown in Figure 4-2, were used to restrain the specimen under compression loadings. Crack length measurements were made with a 40X optical microscope on one side of the specimen every 400 flight hours.

4.3.5 Test Results

The results are presented in Table C-36 in Appendix C. Interpretation of these results is presented in Section 6.

SECTION 5

EVALUATION OF SPECTRA VARIATIONS ANALYSIS AND EXPERIMENTAL RESULTS

The primary objective of this program was to show how spectrum variations affect crack growth. This was done analytically through crack growth analysis of the 116 spectra variations. Crack growth tests were performed with 33 of these spectra in order to check the accuracy of the analysis predicted trends. This section contains the evaluation of these results.

5.1 TEST VERSUS ANALYSIS CRACK GROWTH COMPARISON

Table 5-1 presents the test and linear analysis results of the 33 loads spectra tested. The comparison is made in terms of the crack growth life to propagate the crack, out of one side of a 1/4-inch-diameter hole, from 0.03 to 0.53 inch. Although in most of the tests the crack was propagated at least an inch, the comparison is made over the first half of the inch, because:

- a. Analysis represents crack growth on only one side of the hole, whereas in the great majority of tests cracking was observed on the other side of the hole when the original crack had reached, on the average, a crack length of 0.58 inch.
- b. In several tests, testing was stopped, because of the long test time, before the crack had propagated an inch.
- c. The comparisons show similar trends whether the comparison is made over the first half or the one inch of cracking.

The test results, with two exceptions (BS6.MM13 and BS3.LLT2), are averages of two results. Since the initial crack in testing was not always 0.03 inch, the results shown in Table 5-1 were adjusted to correspond to $a_i = 0.03$ inch.

The linear crack growth analysis accuracy is evaluated against the test results in terms R $_{\Delta \rm N}$ in Table 5-1, where

$$R_{\Delta N} = (\Delta N_{TEST} / \Delta N_{ANAL.})$$

where ΔN_{TEST} and ΔN_{ANAL} are the lives, as determined by test and analysis respectively, to propagate the crack from 0.03 to 0.53 inch, except in the case of spectra BS6.COMB11 and BS6.COMB13, the lives are for shorter crack growth. Histogram of the $R_{\Delta N}$ values is given in Figure 5-1. In 73 percent of the cases the test results were within \pm 30 percent of the predicted values. This reflects good correlation between the test and linear analysis results in view of the scatter associated with crack growth data. The prediction is on the conservative side (predicts

TABLE 5-1
SPECTRA VARIATIONS TEST VERSUS LINEAR ANALYSIS CRACK GROWTH COMPARISON

| | | | | AN = FLT HR FOR a = | HR = | RAN |
|--|---|--|---|--|--|--|
| SPECTRUM | DESCRIPTION | HIGHEST PEAK (PSI) | TEST | C.03 - 0.53 FIN (EXCEP AS NOTED) TEST ANAL | | ANTEST JANAL. |
| BS6 BS1 BS2 BS3 BS4 BS6 | COMPOSITE BASELINE, 5 MISSIONS (RT = 4,000 PSI) BASELINE, MISSION 1 (RT = 4,000 PSI) BASELINE, MISSION 2 (RT = 4,000 PSI) BASELINE, MISSION 3 (RT = 4,000 PSI) BASELINE, MISSION 4 (RT = 4,000 PSI) BASELINE, MISSION 5 (RT = 4,000 PSI) | 23,923 22,114 17,915 24,588 28,841 20,664 | A1, A2 C1 C2 C3, D22 C4 C6 | 4,140 15,365 67,208 1,368 4,044 6,992 | 4,212 16,255 78,347 1,124 3,518 8,124 | 0.98 0.95 0.86 1.22 1.15 0.86 |
| BS4.MM8 BS6.MM13 BS1B.FL3 | MISSION MIX, TRAINING T&G LANDINGS ONLY MISSION MIX, NO LOW ALTITUDE PENETRATION FLYING 4.0-HR FLIGHT 18 | 27,765 25,153 24,478 | C7 D12 D1 | 3,957 15,635 32,702 | 3,011 | 1.31 |
| BS6.ES4 | 1 4 | 22,694 | D7 | 1 | 7,006 | 1.14 |
| BS6.DSL1 BS6.DSL3 BS6.DSL4 BS3.VPC1 | ALL STRESSES INCREASED 15 PERCENT ALL STRESSES DECREASED 26 PERCENT ALL STRESSES INCREASED 35 PERCENT DIFFERENT VALLEY/PEAK COUPLING | 27,512 17,703 32,297 24,588 | D6 D17 D3 | 3,475 13,310 1,740 | 15,415 1,373 1,024 | 1.41 0.86 1.27 1.22 |
| BS3.LLT1 BS3.LLT2 BS6.LLT2 BS6.LLT5 BS6.LLT6 | RANGE TRUNCATION = 4,500 PSI RANGE TRUNCATION = 3,500 PSI RANGE TRUNCATION = 3,500 PSI NO. OF TAXI CYCLES/LANDING INCREASED TO 25.9 RANGE TRUNCATION = 5,000 PSI | 24,588 24,588 23,923 23,923 23,923 | D8 E1 D13 D14 | 1,510 816 4,334 3,499 5,310 | 1,199 864 3,559 4,213 4,589 | 1.26 0.94 1.22 0.83 1.16 |
| BS6.HIL1 BS6.HIL2 BS6.HIL3 BS6.HIL4 BS6.HIL5 | TEN HIGHEST PEAKS n = 1 x 10 TEN HIGHEST PEAKS n = 1 x 20 TEN HIGHEST PEAKS = 33,056 PSI TEN HIGHEST PEAKS = 27,750 PSI TEN HIGHEST PEAKS = 33,056 PSI TEN HIGHEST PEAKS = 33,056 PSI AND n = 1 x 20 | 23,923 23,923 33,056 27,750 33,056 | C8 D18 D15 D9 D19 | 5,929 6,136 6,772 4,920 9,819 | 4,190 4,160 4,206 4,210 4,001 | 1.42 1.48 1.61 1.17 2.45 |
| BS6.CLP3 BS1.MISC9 BS6.MISC2 BS6.MISC6 | P _{CLIP} ≤ 0 NO SEGMENT SEQUENCE WITHIN FLIGHT FLIGHT LOADS AVERAGING INTERNAL ∆g = 0.2 SIMPLIFIED FLT-BY-FLT SPECTRUM | 23,923 22,114 24,790 23,923 | C9 C10 D16 D10 | 5,679 10,265 2,937 4,298 | 4,451 12,721 2,179 5,029 | 1.28 0.81 1.35 0.85 |
| BS6.COMB3 BS6.COMB6 BS6.COMB11 BS6.COMB12 BS6.COMB13 | STRESSES INCREASED 15 PERCENT + RT = 3,500 (1.15) STRESSES DECREASED 10 PERCENT + RT = 3,500 (0.9) NO GROUND CYCLES, FLT 1.0g = 0, STRESSES INCREASED 100 PERCENT RT = 3,500 + TEN HIGHEST PEAKS n = 1 x 10 SPECTRUM BS6.COMB11 STRESSES INCREASED 35 PERCENT | 27,512 21,531 23,419 23,923 31,616 | D11 D20 D21 D23 D21 | 2,438 5,290 12,922* 3,522 2,908** | 1,900 5,261 4,836* 3,344 | 1.28 1.01 2.67* 1.05 |

^{*}a = 0.03 → 0.188 IN. **a = 0.213 → 0.372 IN.

⁵⁸

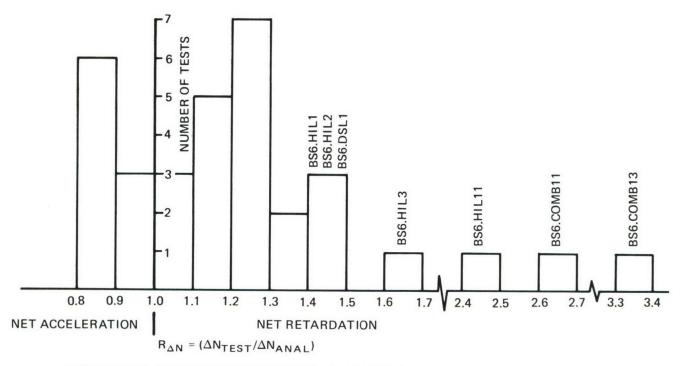


FIGURE 5-1. TEST VERSUS LINEAR ANALYSIS CRACK GROWTH COMPARISON

faster crack growth rate) in the majority of cases, 73 percent of the time. The general analysistest correlation trends are interpreted as follows:

- a. In spectrum loading the loading interaction effects on crack growth may exhibit retardation or acceleration features, or both, as compared to constant amplitude loading da/dN data. Retardation is normally associated with the infrequent high loads, whereas acceleration is considered to be due to compression loads and in some ways due to higher loads following lower loads.
- b. The good correlation of the baseline spectra BS6 test and analysis results is attributed to the counterbalancing retardation and acceleration features of the spectrum and availability of representative da/dN data for analysis. The linear analysis model does not reflect these loading interaction effects whereas in the test these effects are assumed to have been selfcancelling.
- c. The retardation feature in crack growth is clearly illustrated here by looking at the type of spectra represented by the largest discrepancies between test and analysis. These spectra are of two types: HIL spectra with increased frequency and/or magnitude of high infrequent loads relative to the baseline spectrum, and the spectra (BS6.COMB11 and BS6.COMB13) which were drastically changed from a wing lower surface spectrum to a mainly —R spectrum. The behavior of the HIL spectra was to be expected. However, the results of the other two spectra, in particular BS6.COMB11, which does not have any

higher peaks than the baseline spectrum BS6, are not readily explainable. The HIL spectra variation results indicate an increase in retardation (increasing $R_{\Delta N}$ values) with increasing magnitude and frequency of the 10 highest loads in the baseline spectrum BS6:

| | TEN HIGHEST PEAKS, PSI | | VARIA | ATION | $R_{\Delta N}$ |
|-----------|-------------------------|-----|-----------|-----------|----------------|
| SPECTRUM | (% LIMIT DESIGN STRESS) | n | MAGNITUDE | FREQUENCY | (TABLE 5-1) |
| BS6 | 21,465 →23,923 (69%) | 10 | | | 0,98 |
| BS6.HIL1 | 21,465 →23,923 | 100 | | X | 1,42 |
| BS6.HIL2 | 21,465 →23,923 | 200 | - | X | 1.48 |
| BS6.HIL7 | 27,750 (80%) | 10 | × | | 1.17 |
| BS6.HIL3 | 33,056 (95%) | 10 | X | | 1,61 |
| BS6.HIL11 | 33,056 | 200 | X | X | 2,45 |

Note that retardation is greater by increasing the frequency of the 10 highest loads (HIL1 and HIL2) than increasing the magnitude to 27,750 psi (HIL7). Of course, with further increase in magnitude to 33,056 psi (HIL3) as well as frequency (HIL11), the retardation becomes larger.

- d. That retardation is not necessarily the prime loading interaction effect in crack growth under spectrum loading is illustrated in Figure 5-2 in the plot of $R_{\Delta N}$ versus the highest peak stress in the spectrum. The data, taken from Table 5-1, exclude the -R value spectra BS6.COMB11 and BS6.COMB13. As can be seen, there is a very general broad trend between these parameters, but the large scatter indicates other load interaction effects at work.
- e. As stated earlier, the acceleration phenomenon is sometimes considered to be associated with compression loads. This is proven to be so by the following test data:

| | Δ N = FLT HR (a = 0.03 \rightarrow 0.53 IN.) | | | | | | |
|----------|--|------|--|--|--|--|--|
| BS6,CLP3 | P _{CLIP} ≤ 0, NO COMPRESSION STRESSES | 5679 | | | | | |
| BS6 | BASELINE SPECTRUM WITH COMPRESSION STRESSES, 3.5 TAXI CYCLES PER LANDING | 4140 | | | | | |
| BS6.LLT5 | INCREASED NUMBER OF COMPRESSION TAXI CYCLES PER LANDING TO 25,9 | 3499 | | | | | |

Adding compression cycles, or more compression-compression cycles to the spectrum reduces the life, i.e., accelerates the crack growth.

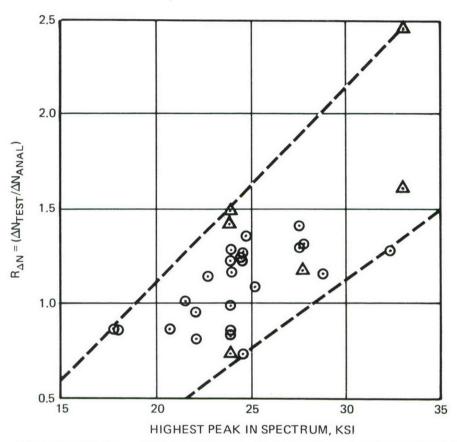


FIGURE 5-2. $R_{\Delta\,N}$ VERSUS THE HIGHEST PEAK IN THE SPECTRUM

f. Crack growth due to spectrum loading, with respect to loads interaction effects appears to be a function of retardation and acceleration phenomena. The only analysis model that will predict the crack growth trends properly is one which contains both retardation and acceleration features. We can view $R_{\Delta N} > 1.0$ only to mean that the spectrum has a net retardation effect or that $R_{\Delta N} < 1.0$ means a net acceleration effect, see Figure 5-1. Since most spectra inherently have both of these effects, $R_{\Delta N}$ indicates only whether one or the other is more predominant.

5.2 SPECTRA VARIATION EFFECTS ON CRACK GROWTH

Spectra variation effects on crack growth are evaluated on the basis of linear analysis results. However, if test data indicate, for a group of similar spectra variations, that the predicted values are not consistently within 30 percent of the test values (R $_{\Delta N}$ not within 1 \pm 0.3), or opposite to test trends, then the evaluation of that group of spectra is based on the test results.

The spectrum variation effect on crack growth is measured in terms of the life ratio,

$$R'_{\Delta N} = (\Delta N_{VAR}/\Delta N_{BS})$$

where

 ΔN = life, in terms of flight hours, to propagate the crack a specified length

VAR = refers to spectrum variation being considered

BS = refers to the baseline spectrum or a reference spectrum to which the variation is being compared.

The variation effect will be considered

| | if $ R'_{\Delta N} - 1 $ |
|------------------|--------------------------|
| not significant | <0.2 |
| significant | ≥0.2 and ≤1.0 |
| very significant | >1.0 |

These levels of significance are not established here as criteria, but simply for convenience in classifying the spectra variation effects in the evaluation that follows.

5.2.1 Baseline, Mission Mix and Flight Length Variations

The results are given in Table 5-2. Test to analysis correlation, in terms of $R_{\Delta N}$, for this group of spectra satisfies (with one minor exception of $R_{\Delta N}=1.31$) the criteria established for using the analysis results. All of these spectra are initially considered in one group because the variations have a common variable. This variable is the variation in aircraft usage, from aircraft to aircraft or from one time interval to another even of the same aircraft. The variation range from different mission mixes to individual missions and flights and to variation of individual flight lengths. Comparison of all of these spectra to the baseline composite mission mix spectrum BS6 shows a very significant variation in crack growth lives,

$$R'_{\Delta N} = 0.26 \longrightarrow 21.43$$

This converts to a ratio of almost 80 between the longest and shortest life. However, if the life parameter was changed from flight hours to landings, this ratio would decrease to 15. Now to look at specific variations in this group.

Amount of Training — The percent of total usage time spent in training (Missions 4 and 5) was varied from zero to 100 percent, see table on page 64. The variation in life is small (1.6 from low to high) if measured in flight hours, but much higher (8.2) if life is measured in landings, reflecting the high frequency of landings in training.

TABLE 5-2

BASELINE, MISSION MIX AND FLIGHT LENGTH SPECTRA VARIATION EFFECT ON CRACK GROWTH

| (ANVAR) | TEST | ŀ | 3.71 | 16.19 | 0.33 | 0.98 | 1.69 | | | | | | | | 96.0 | | | | | 3.78 | | | | | | | 7.90 |
|--|--|-----------------------|---------------------------|--------|-------|---------------------------|------------------|--------------------------|--------------------------|----------|----------|----------|----------|---------------------------------|----------------------------|----------------------------------|----------------------------------|---------------------|-------------------------|-----------------------------|---|-------------------------|------------------------|------------------------|-------------------------|------------------------|------------------------|
| R' ^n = | | 1 | 3.86 | 18.60 | 0.27 | 0.84 | 1.93 | 8.01 | 2.77 | 0.26 | 0.27 | 1.14 | 0.47 | 1.13 | 0.71 | 0.97 | 0.88 | 0.62 | 1.18 | 3.43 | 0.59 | 4.19 | 14.73 | 21.43 | 1.66 | 4.73 | 6.55 |
| R∆N | $\left(\frac{\Delta N_{\text{ANAL.}}}{\Delta N_{\text{ANAL.}}}\right)$ | 0.98 | 0.95 | 98.0 | 1.22 | 1.15 | 0.86 | | | | | | | | 1.31 | | | | | 1.08 | | | | | | | 1.18 |
| = FLT HR 0.03 → 0.53 IN.) | TEST | 4,140 | 15,365 | 67,208 | 1,368 | 4,044 | 6,992 | | | | | | | | 3,957 | | | | | 15,635 | | | | | | | 32,702 |
| $\Delta N = FLT HR$ $(a = 0.03 \rightarrow 0.53$ | ANALYSIS | 4,212 | 16,255 | 78,347 | 1,124 | 3,518 | 8,124 | 33,719 | 11,670 | 1,097 | 1,138 | 4,812 | 1,992 | 4,751 | 3,011 | 4,095 | 3,711 | 2,604 | 4,957 | 14,457 | 2,504 | 17,632 | 62,048 | 90,284 | 7,005 | 19,902 | 27,600 |
| SPECTRUM | DESCRIPTION | COMPOSITE MISSION MIX | MISSION 1, FLTS 1a AND 1b | | | MISSION 4, FLTS 4a AND 4b | MISSION 5, FLT 5 | FLT 1a, 0.989 HOURS LONG | FLT 1b, 0.989 HOURS LONG | FLT 3a | FLT 3b | FLT 4a | FLT 4b | TRAINING ONLY, MISSIONS 4 AND 5 | TOUCH AND GO LANDINGS ONLY | NO TRAINING, MISSIONS 1,2, AND 3 | 50 PERCENT REDUCTION IN TRAINING | FLTS 1a AND 3a ONLY | FLTS 1b, 2, AND 3b ONLY | NO LOW ALTITUDE PENETRATION | 100 PERCENT INCREASE IN LOW ALT PENETR TIME | FLT 1a, 0.541 HOUR LONG | FLT 1a, 2.0 HOURS LONG | FLT 1a, 4.0 HOURS LONG | FLT 1b, 0.605 HOUR LONG | FLT 1b, 2.0 HOURS LONG | FLT 1b, 4.0 HOURS LONG |
| | IDENTIFICATION | BS6 | BS1 | BS2 | BS3 | BS4 | BS5 | BS1.MM1A | BS1.MM1B | BS3.MM3A | BS3.MM3B | BS4.MM4A | BS4.MM4B | BS45.MM7 | BS4.MM8 | BS123.MM9 | BS6.MM10 | BS13.MM11 | BS123.MM12 | BS6.MM13 | BS6.MM14 | BS1A.FL1 | BS1A.FL2 | BS1A.FL3 | BS1B.FL1 | BS1B.FL2 | BS1B.FL3 |

| | | Δ N (a = 0.03 \rightarrow 0.53 IN.) | | | |
|-----------|-----------------------------|--|----------|--|--|
| SPECTRUM | PERCENT OF TIME IN TRAINING | FLTHR | LANDINGS | | |
| BS123,MM9 | 0 | 4,095 | 3,667 | | |
| BS6.MM10 | 10,2 | 3,711 | 4,755 | | |
| BS6 | 20.4 | 4,212 | 6,475 | | |
| BS45.MM7 | 100 | 4,751 | 19,228 | | |
| BS4.MM8 | 100* | 3,011 | 30,110 | | |

^{*}TOUCH AND GO LANDINGS ONLY.

Low Altitude Penetration Flying — Low altitude penetration flying (LAPF) produces severe gust and maneuver loading spectra. The effect of this was investigated by varying the LAPF time in the overall usage:

| | | Δ N (a = 0.03 \rightarrow 0.53 IN.) | | | |
|----------|-------------------------|--|----------|--|--|
| SPECTRUM | PERCENT OF TIME IN LAPF | FLT HR | LANDINGS | | |
| BS6.MM13 | 0 | 14,457 | 21,200 | | |
| BS6 | 20,5 | 4,212 | 6,475 | | |
| BS6.MM14 | 41 | 2,504 | 4,116 | | |
| BS3 | 100 | 1,124 | 2,298 | | |

The ratio in life between zero and 100 percent LAPF time is 12.9 when measuring life in flight hours, a very significant variation.

Flight Length — The length of flights 1a and 1b was varied from flights without cruise to 4.0-hour flights:

| | | Δ N (a = 0.03 \rightarrow 0.53 IN.) | | | |
|----------|-----------------------|--|----------|--|--|
| SPECTRUM | FLIGHT LENGTH – HOURS | | LANDINGS | | |
| BS1A.FL1 | 0,541 | 17,632 | 32,592 | | |
| BS1.MM1A | 0.989 | 33,719 | 34,094 | | |
| BS1A.FL2 | 2.0 | 62,048 | 31,024 | | |
| BS1A.FL3 | 4.0 | 90,284 | 22,571 | | |
| BS1B.FL1 | 0,605 | 7,005 | 11,579 | | |
| BS1,MM1B | 0.989 | 11,670 | 11,800 | | |
| BS1B.FL2 | 2.0 | 19,902 | 9,951 | | |
| BS1B,FL3 | 4.0 | 27,600 | 6,900 | | |

The variation in flight hours between the shortest and longest flights is very significant, 5.1 and 3.9 for flights 1a and 1b. However, in terms of landings it is much smaller (1.4 and 1.7), indicating that for these types of flights the crack growth per flight does not vary much with flight length.

Payload — Stresses in the wing are directly affected by the amount of payload carried. Mission mixes and individual flights with different amounts of payload were considered:

| | PAYLOAD, | | $\Delta N (a = 0.03 \rightarrow 0.53 IN.)$ | | |
|-----------------------|----------|---------------------------|--|----------|--|
| SPECTRUM | PERCENT | DESCRIPTION | FLT HR | LANDINGS | |
| BS13,MM11 | 34.3 | FLIGHTS 1a AND 3a | 2,604 | 3,715 | |
| BS6 | 46.3 | ALL MISSIONS | 4,212 | 6,475 | |
| BS123,MM9 | 66.8 | FLIGHTS 1a, 1b, 2, 3a, 3b | 4,095 | 3,667 | |
| BS123,MM12 | 85.5 | FLIGHTS 1a, 2, 3b | 4,957 | 3,652 | |
| BS1,MM1A | 21,8 | FLIGHT 1a | 33,719 | 34,094 | |
| BS1,MM1B | 75.0 | FLIGHT 1b | 11,670 | 11,800 | |
| BS3.MM3A | 43.5 | FLIGHT 3a | 1,097 | 2,243 | |
| BS3 _• MM3B | 100,0 | FLIGHT 3b | 1,138 | 2,327 | |

The expected trend is to see a decreasing life with increasing payload. No such consistent trend is seen here. It appears that other factors, such as the strong influence of the very severe flights (3a, 3b) in mission mixes, smaller gust response load factors due to higher airplane gross weights, and differences in maneuver spectra produce sufficient influences to reduce the effect of payload. Only in the case of flights 1a and 1b is the influence of payload clearly shown, a three-fold reduction in life due to approximately a three-fold increase in payload.

5.2.2 Sequence of Missions

The effect of the sequence of missions (more specifically, flights) in the spectrum was investigated by producing four variations of the baseline spectra BS1 and BS6. No spectra were tested from this group. However, because of the similarity of these spectra to those shown tested in Table 5-2, linear analysis results of these spectra are considered to be verified. The spectra are:

| SPECTRUM | DESCRIPTION | Δ N (a = 0.03 $ ightarrow$ 0.53 IN.) FLT HR | $ \frac{R'_{\DeltaN}}{\left(\frac{\DeltaN_{VAR}}{\DeltaN_{BS}}\right)} $ |
|----------------------|---|---|--|
| BS1 | BASELINE SPECTRUM, RANDOM FLIGHT SEQUENCE | 16,255 | - |
| BS1,SM1 | LO-HI-LO FLIGHT SEQUENCE BASED ON THE LARGEST PEAK PER FLIGHT | 16,266 | 1,00 |
| BS6 | BASELINE SPECTRUM, RANDOM FLIGHT SEQUENCE | 4,212 | - |
| BS6,SM1 | LO-HI-LO FLIGHT SEQUENCE BASED ON THE LARGEST PEAK PER FLIGHT | 4,051 | 0.96 |
| BS6,SM4 | SPECIFIC ORDERED FLIGHT SEQUENCE WITH GROUPINGS OF TRAINING FLIGHTS | 4,245 | 1,01 |
| BS6 _s SM5 | A DIFFERENT RANDOM SEQUENCE OF FLIGHTS | 4,226 | 1.00 |

The effect of mission (flight) sequence on crack growth is not significant.

5.2.3 Flight Segments

Five spectra were generated to investigate the effect of simplifying the development of the spectrum through reduction of the number of segments or the number of load factor-stress transfer functions considered in a flight. No spectra were tested from this group. However, because of the similarity of these spectra to those shown tested in Table 5-2, linear analysis results of these spectra are considered to be verified. The spectra are:

| SPECTRUM | DESCRIPTION | Δ N (a = 0.03 \rightarrow 0.53 IN.) FLT HR | $ \frac{R_{\DeltaN}'}{\left(\frac{(\DeltaN_{VAR})}{(\DeltaN_{BS})}\right) }$ |
|----------|---|--|--|
| BS1 | BASELINE SPECTRUM | 16,255 | - |
| BS1,FS3 | FLAPS UP CLIMB AND DESCENT GUST SEGMENTS SIMPLIFIED INTO ONE SEGMENT FOR CLIMB AND DESCENT EACH | 18,475 | 1.14 |
| BS1.FS4 | FLAPS UP CLIMB AND DESCENT LOAD FACTOR — STRESS TRANSFER FUNCTION SAME AS FOR CRUISE | 16,021 | 0.99 |
| BS1,FS5 | ALL CLIMB AND DESCENT LOAD FACTOR — STRESS TRANSFER FUNCTIONS SAME AS FOR CRUISE | 17,569 | 1,08 |
| BS6 | BASELINE SPECTRUM | 4,212 | |
| BS6.FS1 | LANDING IMPACT CYCLES EXCLUDED | 4,217 | 1.00 |
| BS6.FS2 | FLAPS UP CLIMB AND DESCENT GUST SEGMENTS SIMPLIFIED INTO ONE SEGMENT FOR CLIMB AND DESCENT EACH | 4,262 | 1.01 |

The effect of these segment orientated variations on crack growth is not significant. It must be noted that only one cycle per landing was considered in spectrum BS6.

5.2.4 Exceedance Spectra

The variation in loads occurrences and magnitude between aircraft may be viewed in terms of changing the slope or N_0 (exceedances at zero load), of the exceedances spectra, see Figure 2-7. Four such variations were generated on flight loads of the baseline spectrum BS6. Only one of the spectra was tested, see next page. R $_{\Delta N}=1.14$ indicates a satisfactory verification of the linear analysis results for this group. The effect of varying N_0 is almost directly proportional to the N_0 variation of 15 percent, and thus, not significant. The variation of the exceedance spectra slope by 15 percent has a larger, and a significant effect, see next page.

| | | Δ N = FLT HR (a = 0.03 \rightarrow 0.53 IN.) | | $\frac{R_{\Delta N}}{\Delta N_{TEST}}$ | $R'_{\Delta N} = \left(\frac{\Delta N_{VAR}}{\Delta N_{BS6}}\right)$ | |
|----------|---|---|------|--|--|------|
| SPECTRUM | DESCRIPTION | ANAL. | TEST | ANAL. | ANAL. | TEST |
| BS6 | BASELINE | 4212 | 4140 | 0,98 | - | - |
| BS6,ES1 | GUST AND MANEUVER SPECTRA N ₀ INCREASED 15 PERCENT | 3728 | | | 0.89 | |
| BS6.ES2 | GUST AND MANEUVER SPECTRA N ₀ DECREASED 15 PERCENT | 4843 | | | 1,15 | |
| BS6,ES3 | GUST AND MANEUVER EXCEEDANCE SPECTRA SLOPE INCREASED 15 PERCENT | 2760 | | | 0,66 | |
| BS6.ES4 | GUST AND MANEUVER EXCEEDANCE SPECTRA SLOPE DECREASED 15 PERCENT | 7006 | 7992 | 1.14 | 1,66 | 1,93 |

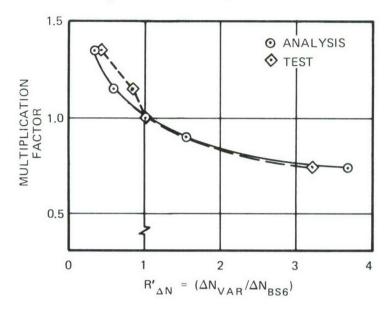
5.2.5 Design Stress Level

These variations consist of increasing or decreasing all stresses in a baseline spectrum by multiplying them by a constant. The effect of this variation on peak loads is illustrated by Figure 2-7 and analysis and test results are given in Table 5-3. These variations may be viewed as representing design stress level or usage severity change or any other cause which would change all the stresses in the spectrum by a constant. However, it should be noted that, in the way these spectra were generated, the range truncation level effectively became different for the variations, see Table 5-3. If the range truncation of 4000 psi were kept for all spectra the effect on crack growth would be even more pronounced, i.e., even shorter life for spectra with increased stress levels and longer life for spectra with lower stresses than shown in Table 5-3.

TABLE 5-3
DESIGN STRESS LEVEL SPECTRA VARIATIONS
EFFECT ON CRACK GROWTH

| | SPECTRUM | RANGE TRUNCATION | | FLT HR → 0.53 IN.) | $\frac{R_{\Delta N}}{\left(\frac{\Delta N_{TEST}}{}\right)}$ | | N _{VAR} |
|----------|------------------------|---------------------|--------|-----------------------|--|-------|------------------|
| IDENTIF | DESCRIPTION | (PSI) | ANAL. | TEST | ANAL. | ANAL. | TEST |
| BS1 | BASELINE | 4000 | 16,255 | 15,365 | 0.95 | _ | _ |
| BS1.DSL1 | STRESSES INCREASED 15% | 4000 (1.15) | 9,683 | | | 0.60 | |
| BS1.DSL2 | STRESSES DECREASED 10% | 4000 (0.9) | 24,838 | | | 1.53 | |
| BS3 | BASELINE | 4000 | 1,124 | 1,368 | 1.22 | - | - |
| BS3.DSL1 | STRESSES INCREASED 15% | 4000 (1.15) | 653 | | - | 0.58 | |
| BS3.DSL2 | STRESSES DECREASED 10% | 4000 (0.9) | 1,736 | | | 1.54 | |
| BS4 | BASELINE | 4000 | 3,518 | 4,044 | 1.15 | _ | _ |
| BS4.DSL1 | STRESSES INCREASED 15% | 4000 (1.15) | 2,096 | | | 0.60 | |
| BS4.DSL2 | STRESSES DECREASED 10% | 4000 (0.9) | 5,378 | | | 1.53 | |
| BS6 | BASELINE | 4000 | 4,212 | 4,140 | 0.98 | - | - |
| BS6.DSL1 | STRESSES INCREASED 15% | 4000 (1.15) | 2,460 | 3,475 | 1.41 | 0.58 | 0.84 |
| BS6.DSL2 | STRESSES DECREASED 10% | 4000 (0.9) | 6,516 | | | 1.55 | |
| BS6.DSL3 | STRESSES DECREASED 26% | 4000 (0.74) | 15,415 | 13,310 | 0.86 | 3.66 | 3.21 |
| BS6.DSL4 | STRESSES INCREASED 35% | 4000 (1.35) | 1,373 | 1,740 | 1.27 | 0.33 | 0.42 |
| | | | | 1 | | | |

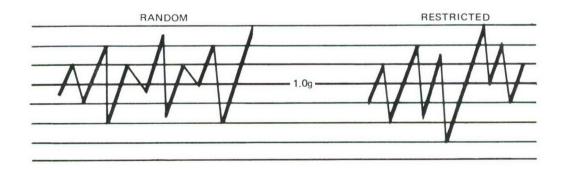
As seen in Table 5-3, correlation between test and analysis is acceptable in two of the three DSL spectra tests. In the third test (BS6.DSL1), R $_{\Delta N}=1.41$ is larger than 1.3 established as criteria for analysis verification. However, if we look at the overall analysis and test results, see below, it is seen that the trend and the extremes of the variation are predicted sufficiently accurately, so that the analysis results are accepted as satisfactory to evaluate the effect on crack growth.



The effect of variation is about the same for all four baseline spectra considered. Remembering that with the same range truncation for all spectra, the variation of crack life would be even larger, any change of spectrum stresses by more than 10 percent is considered to have a significant (0.8 > R' $_{\Delta N}$ > 1.2) effect on crack growth.

5.2.6 Valley/Peak Coupling

All spectra, except in this group, were generated using the random coupling of peaks and valleys, as defined in the spectrum generation program, Reference 1. In this group, the valley/peak coupling of the six baseline spectra was changed to the A6PA program version restricted coupling (Reference 1) so that cycles cycling about 1.0g were defined to have equal incremental stresses above and below 1.0g or 1.0g was the peak or valley:



| | VALLEY/PEAK COUPLING | | Δ N = FLT HR (a = 0.03 \rightarrow 0.53 IN.) | | $\frac{R_{\Delta N}}{\left(\frac{\Delta N_{TEST}}{}\right)}$ | $R'_{\Delta N} = \left(\frac{\Delta N_{VAR}}{\Delta N_{BS}}\right)$ | |
|-----------------|----------------------|------------|---|----------------|--|---|------|
| SPECTRUM | RANDOM | RESTRICTED | ANAL. | TEST | $\Delta N_{ANAL.}$ | ANAL. | TEST |
| BS1 BS1,VPC1 | х | × | 16,255 15,501 | 15,365 | 0,95 | 0,95 | - |
| BS2 BS2,VPC1 | Х | × | 78,347 72,942 | 67,208 | 0.86 | 0,93 | - |
| BS3 BS3,VPC1 | Х | х | 1,124 1,024 | 1,368 1,247 | 1,22 1,22 | 0,91 | 0,91 |
| BS4 BS4,VPC1 | х | х | 3,518 3,362 | 4,044 | 1,15 | 0,96 | - |
| BS5 BS5,VPC1 | х | × | 8,124 6,330 | 6,992 | 0,86 | _ 0.78 | - |
| BS6 BS6.VPC1 | Х | × | 4,212 3,843 | 4,140 | 0,98 | _ 0,91 | - |

The single test result, see above, verifies analysis results as acceptable for evaluation of these variations. The effect of a restricted valley/peak coupling, compared to the random coupling, is small and is not significant. It is less than 10 percent, on the conservative side, for five of the six baseline spectra, and 22 percent for the other (BS5.VPC1) spectrum.

5.2.7 Low Load Truncation

Here we are concerned with the effect of eliminating all cycles which might not contribute significantly to crack growth. In this group the variations mainly dealt with elimination of cycles on the basis of cycle stress range, so-called range truncation (RT). The baseline spectra RT were 4000 psi. The variations covered RT from 3000 to 5000 psi. In addition to the 14 range truncation variations of four baseline spectra, two variations were concerned with the number of compression-compression taxi cycles in baseline spectrum BS6. The analysis and test results are summarized in Table 5-4.

Range Truncation — First, let us look at the effect of range truncation. Test-to-analysis correlation is good ($R_{\Delta N}$ within 1 ± 0.3). However, the trend in one of the tests (BS6.LLT2) is opposite of the analysis. The expected trend is decreasing or constant life with decreasing range truncation level, i.e., adding more cycles with smaller ranges will add to crack growth until a point is reached where additional cycles will not produce any significant crack growth and life will remain constant. Also, life may be further decreased due to reduction of the retardation effect by increasing the number of cycles between peaks producing retardation. In view of these considerations, spectrum BS6.LLT2 nonconforming test result is attributed to scatter, and analysis results are accepted as predicting the trend. Using the baseline spectra with RT = 4000 psi as the reference point, life increase by removing cycles with ranges up to 5000 psi is not

very significant: up to 9 percent by analysis, up to 28 percent by testing. However, it does indicate that these cycles (stress range between 4000 and 5000 psi) do contribute to crack growth. The other question is, how significant are the cycles with ranges below 4000 psi? Decreasing the RT to 3500 psi produces a life reduction between 13 and 40 percent, depending on the baseline spectrum and analysis or test results. Decreasing the RT to 3000 psi, analysis indicates a reduction in life up to 28 percent. All of these reductions are not very significant.

TABLE 5-4
LOW LOAD TRUNCATION SPECTRA VARIATIONS
EFFECT ON CRACK GROWTH

| | SPECTRUM | Δ N = F (a = 0.03 - | LT HR > 0.53 IN.) | $R_{\Delta N}$ $\left(\frac{\Delta N_{TEST}}{\Delta N}\right)$ | $R_{\Delta N}^{I} = \begin{pmatrix} \Delta \\ -\Delta \end{pmatrix}$ | N _{VAR} |
|----------|------------------------------------|----------------------------|----------------------|--|--|------------------|
| IDENTIF | DESCRIPTION | ANAL. | TEST | ANAL. | ANAL. | TEST |
| | RANGE TRUNCATION (PSI): | | | | | |
| BS1 | 4000 | 16,255 | 15,365 | 0.95 | _ | _ |
| BS1.LLT1 | 4500 | 16,449 | | | 1.01 | |
| BS1.LLT2 | 3500 | 14,008 | | | 0.86 | |
| BS1.LLT3 | 3000 | 14,573 | | | 0.90 | |
| BS3 | 4000 | 1,124 | 1,368 | 1.22 | _ | _ |
| BS3.LLT4 | 5000 | 1,198 | | | 1.07 | |
| BS3.LLT1 | 4500 | 1,199 | 1,510 | 1.26 | 1.07 | 1.10 |
| BS3.LLT2 | 3500 | 864 | 816 | 0.94 | 0.77 | 0.60 |
| BS3.LLT3 | 3000 | 810 | | | 0.72 | |
| BS4 | 4000 | 3,518 | 4,044 | 1.15 | _ | _ |
| BS4.LLT1 | 4500 | 3,587 | | | 1.02 | |
| BS4.LLT2 | 3500 | 3,070 | | | 0.87 | |
| BS4.LLT3 | 3000 | 3,106 | | | 0.88 | |
| BS6 | 4000 | 4,212 | 4,140 | 0.98 | _ | |
| BS6.LLT6 | 5000 | 4,589 | 5,310 | 1.16 | 1.09 | 1.28 |
| BS6.LLT1 | 4500 | 4,457 | | | 1.06 | |
| BS6.LLT2 | 3500 | 3,559 | 4,334 | 1.22 | 0.84 | 1.05 |
| BS6.LLT3 | 3000 | 3,162 | | | 0.75 | |
| | NUMBER OF TAXI CYCLES PER LANDING: | | | | | |
| BS6 | 3.5 | 4,212 | 4,140 | 0.98 | - | _ |
| BS6.LLT4 | 1.0 | 4,218 | | | 1.00 | |
| BS6.LLT5 | 25.9 | 4,213 | 3,499 | 0.83 | 1.00 | 0.85 |

The remaining question seems to be, whether reduction of the RT level below 3000 psi would result in significant life reductions. Test data from Reference 9, range truncation study with a transport-tanker wing lower surface spectrum, provide more insight into this matter. RT levels down to 1500 psi were investigated. Further description of this study is given in Section 6.2 of this report. The results from Reference 9 and this program are combined and presented in Figure 5-3. The data represent cracking out of a hole, open or with a neat fit pin, on three aluminum alloys, with either through-the-thickness or corner initial cracks. Except in one series of tests, in which the crack growth was only 0.14 inch, all other data represent crack growth over 0.5-inch length, starting with an 0.03- or 0.05-inch length. Reference 9 data confirm the

TEST DATA:

| SYMBOL | SPECTRUM | MATERIAL | a _i | a (IN.) | HOLE | REF |
|------------|----------|----------|----------------|-------------|--------|---------|
| 0 | BS3 | 7475 | TTC | 0.03 → 0.53 | OPEN | THIS |
| \bigcirc | BS6 | | | | | PROGRAM |
| Δ | | 2024 | | | 0051 | |
| 0 | KC10.W6 | 7075 | СС | 0.05 → 0.55 | OPEN | 9 |
| | KC10.W6 | 2024 | CC | 0.05 → 0.55 | | 9 |
| | | 7075 | | | FILLED | |
| | KC10.W5 | 2024 | | 0.05 → 0.19 | | |

TTC = THRU-THICKNESS CRACK
CC = CORNER CRACK

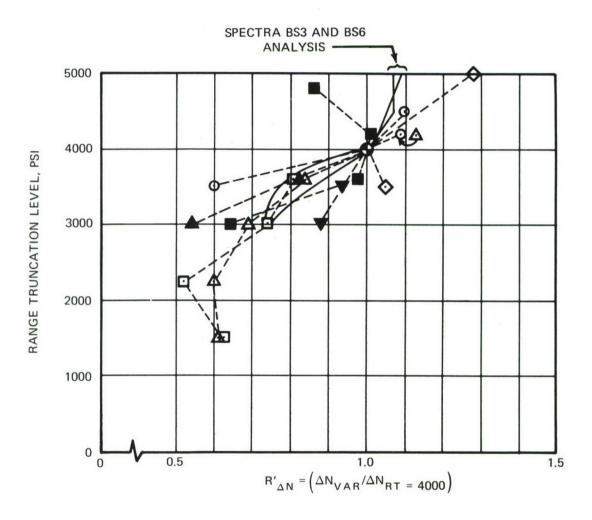
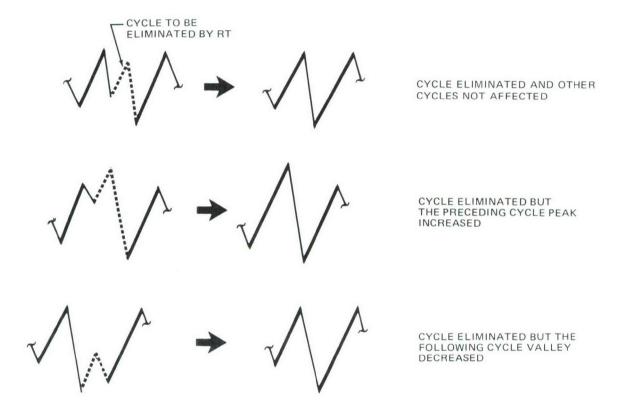


FIGURE 5-3. EFFECT OF RANGE TRUNCATION ON CRACK GROWTH (ALUMINUM ALLOYS, t = 0.25 IN., CRACK ON ONE SIDE OF 1/4-INCH-DIAMETER HOLE; ΔN = FLT HR)

findings of this program and indicate a life reduction between 40 and 50 percent when RT is reduced to 2250 psi. Further reduction of RT down to 1500 psi did not produce any further reduction in life, but just the opposite, a small increase in life. Whether this is simply scatter or a definite trend is not clear at this time. It is also interesting that this trend was predicted by linear analysis. One explanation perhaps can be found in the method of generating these spectra variations, see Reference 1. A cycle, which is defined as the loading from a valley to a peak and then to the next valley, will be eliminated if its range (first valley to peak) is less than the specified RT level, with one exception. If the peak or valley of the cycle to be eliminated is larger or smaller than the preceding or following cycle peak or valley, then the peak of the preceding cycle or the valley of the following cycle is replaced with the peak or the valley of the cycle being eliminated. Examples:



Thus, this method of range truncation will reduce the number of cycles when going from lower to higher RT level, but the spectrum at the higher RT level may have cycles with larger ranges which produce more crack growth than the two independent cycles at the lower RT. This feature of the spectrum sequence generation method needs to be investigated further, including experimental verification.

The importance of eliminating unnecessary cycles from the spectrum, with respect of analysis and testing costs, and schedules, is clearly illustrated by Figure 5-4. It shows the variation in cycles of spectra with different RT levels. Spectra from this and Reference 9 programs show the same behavior. Using RT = 4000 as the reference point, there is an eight-fold increase in the

number of cycles if the RT level is lowered to 1500 psi. In actual cycle-by-cycle analysis and testing costs this would represent a similar increase in costs. Looking back at Figure 5-3, the optimum RT level would appear to be somewhere around 2250 psi. This represents around five-fold increase in the number of cycles relative to the 4000-psi truncation level and a corresponding decrease in life in the vicinity of 50 percent. In general, the optimum RT level may vary as a function of spectrum, material, geometry of the crack and structural details and crack length.

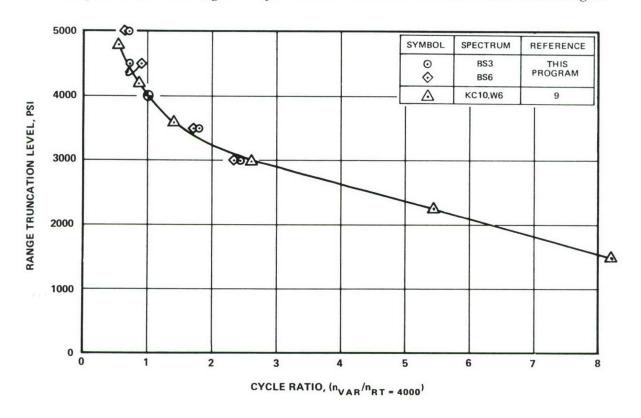


FIGURE 5-4. EFFECT OF RANGE TRUNCATION ON NUMBER OF CYCLES IN SPECTRUM

Compression Cycles — The other variation considered in this group was the number of compression-compression taxi cycles in the spectrum. Usually, in testing and analysis spectra, compression-compression cycles are left out completely, leaving only a representative compression valley so it can form, with a tension loading, a —R value cycle. Analysis and test results for these variations are given in Table 5-4. The number of taxi cycles per landing was varied from 1.0 to an average of 25.9 in the baseline spectrum BS6. Analysis shows no effect on crack growth. The test of a spectrum with 25.9 cycles per landings showed a 15-percent decrease in life relative to the baseline spectrum with 3.5 cycles per landing. The effect is not significant. Whether this is just test data scatter or a real effect is not certain. However, test results with another spectrum (BS6.CLP3), in which all compression stresses were eliminated showed a 37-percent increase in life, relative to the baseline spectrum, whereas analysis predicted only 6-percent increase. This appears to confirm that compression-compression cycles do contribute indirectly to crack growth, perhaps in the form of accelerating crack growth under tension-tension cycle loadings.

5.2.8 High Infrequent Loads

The statistics of loads distributions are most uncertain in the extremes of the distribution, in the area of infrequent loads. The effect of varying the frequency and magnitude of the 10 highest peak values in baseline spectra was investigated through the 21 spectra analyses and test results summarized in Table 5-5. The effect on peak loads distribution is illustrated in Figure 2-7. As test results indicate, linear analysis does not predict the effect of increasing the magnitude and/or frequency of the high infrequent loads. The evaluation of these effects will be done only on baseline spectrum BS6 on the basis of test results. The effect is significant or very significant in most cases, with life increases, due to retardation effects, ranging from 19 to 137 percent. Increasing the number of occurrences of the 10 highest peaks, in the 2500-flight-hour spectrum, to 100 and 200 increased the life by 43 and 48 percent. Increasing the magnitude of the 10 highest peaks (21,465 through 23,923 psi) to 27,750 and 33,056 psi increased the life 19 and 64 percent. Finally, increasing the magnitude and frequency to 33,056 psi and 200 cycles produced a life increase of 137 percent, indicating that retardation is a function of the magnitude and frequency of the high loads. The final question perhaps would be: how frequent must the infrequent loads become to cause a reduction in life?

TABLE 5-5
HIGH INFREQUENT LOADS SPECTRA VARIATIONS
EFFECT ON CRACK GROWTH

| | BS TEN HIGHEST PEAKS IN 2,500 FLT HR* | | $\Delta N = FLT HR$ | | $\frac{R_{\Delta N}}{\left(\frac{\Delta N_{TEST}}{}\right)}$ | $R'_{\Delta N} = \left(\frac{\Delta N_{VAR}}{\Delta N_{BS}}\right)$ | |
|----------|--|---------------------------|---------------------|---------------------|--|---|------|
| SPECTRUM | MAGNITUDE (PSI) INCREASED TO | FREQUENCY INCREASED TO | (a = 0.03 ANAL. | → 0.53 IN.) TEST | $\left(\frac{1}{\Delta N_{ANAL}}\right)$ | ANAL. | TEST |
| BS1 | _ | - | 16,255 | 15,365 | 0.95 | - | - |
| BS1.HIL1 | - | 100 | 15,867 | | | 0.98 | |
| BS1.HIL2 | _ | 200 | 15,462 | | | 0.95 | |
| BS1.HIL4 | 27,750 | - | 16,184 | | | 1.00 | |
| BS1.HIL3 | 33,056 | - | 16,104 | | | 0.99 | |
| BS1.HIL6 | 27,750 | 200 | 14,393 | | | 0.89 | |
| BS1.HIL5 | 33,056 | 200 | 13,238 | | | 0.81 | |
| BS3 | _ | _ | 1,124 | 1,368 | 1.22 | - | _ |
| BS3.HIL1 | _ | 100 | 1,121 | | | 1.00 | |
| BS3.HIL2 | _ | 200 | 1,117 | | | 0.99 | |
| BS3.HIL4 | 27,750 | _ | 1,124 | | | 1.00 | |
| BS3.HIL3 | 33,056 | - | 1,124 | | | 1.00 | |
| BS3.HIL6 | 27,750 | 200 | 1,123 | | | 1.00 | |
| BS3.HIL5 | 33,056 | 200 | 1,102 | | | 0.98 | |
| BS6 | _ | | 4,212 | 4,140 | 0.98 | - | _ |
| BS6.HIL1 | _ | 100 | 4,190 | 5,929 | 1.42 | 0.99 | 1.43 |
| BS6.HIL2 | _ | 200 | 4,160 | 6,136 | 1.48 | 0.99 | 1.48 |
| BS6.HIL4 | 27,750 | _ | 4,210 | 4,920 | 1.17 | 1.00 | 1.19 |
| BS6.HIL3 | 33,056 | _ | 4,206 | 6,772 | 1.61 | 1.00 | 1.64 |
| BS6.HIL6 | 27,750 | 200 | 4,190 | | | 0.99 | |
| BS6.HIL5 | 33,056 | 200 | 4,001 | 9,819 | 2.45 | 0.95 | 2.37 |

*BS1: 19,657 → 22,114 PSI BS3: 22,003 → 24,588 PSI BS6: 21,465 → 23,923 PSI

5.2.9 Clipping of Large Loads

In the previous variations, the high infrequent loads magnitude and frequency were increased. The result was an increase in life. In this group of variations the emphasis is in the other direction, i.e., deletion of the tension or compression extreme loads. For an example illustration see Figure 2-7. Two of the variations deal with the tension loads and two with compression:

| | | Δ N = FI (a = 0.03 $-$ | | $\frac{R_{\DeltaN}}{\left(\frac{\DeltaN_{TEST}}{TEST}\right)}$ | $R'_{\Delta N} = $ | $\frac{\Delta N_{VAR}}{\Delta N_{BS6}}$ |
|----------|--|-------------------------------|------|--|--------------------|---|
| SPECTRUM | DESCRIPTION | ANAL. | TEST | ANAL. | ANAL. | TEST |
| BS6 | BASELINE SPECTRUM, HIGHEST TENSION = 23,923 PSI, HIGHEST COMPRESSION = -24,298 PSI | 4212 | 4140 | 0,98 | - | - |
| BS6,CLP1 | ALL STRESSES ABOVE 21,531 PSI SET EQUAL TO 21,531 PSI; AFFECTS APPROX 10 CYCLES* | 4212 | | | 1,00 | |
| BS6,CLP2 | ALL STRESSES ABOVE 17,942 PSI SET EQUAL TO 17,942 PSI; AFFECTS APPROX 300 CYCLES* | 4217 | | | 1.00 | |
| BS6.CLP3 | ALL STRESSES BELOW ZERO SET EQUAL TO ZERO; AFFECTS APPROX 18,000 CYCLES* | 4451 | 5679 | 1,28 | 1.06 | 1,37 |
| BS6,CLP4 | ALL STRESSES BELOW -5000 PSI SET EQUAL TO -5000 PSI; AFFECTS APPROX 5000 CYCLES* | 4302 | | | 1,02 | |

^{*}IN 2500 FLIGHT HOURS

With respect to clipping of the tension loads, spectra CLP1 and CLP2, analysis results are considered invalid in view of the HIL spectra variations test results, see Section 5.2.8. The expectation is that clipping the high infrequent loads will decrease life by removing peaks causing retardation in the baseline spectrum.

In the other category of clipping the compression loads, spectra CLP3 and CLP4, analysis prediction which shows basically no effect, is not accepted as valid in view of 37-percent increase in life exhibited by the test result.

5.2.10 Miscellaneous Variations

Ten variations were generated mainly to investigate some of the mechanics of spectra development. They were concerned with the averaging interval of the incremental load factor spectrum, varying the repeatable spectrum length, simplifying the random spectrum, looking into the possible effect of a load alleviation system, producing a different sequence of cycles within a flight, and finally a spectrum with the elimination of all taxi, landing impact, and GAG cycles. The analysis and test results are presented in Table 5-6. In view of the good correlation of analysis and test results in this group (if not always in magnitude, at least in trends) as well as similar spectra in other groups, analysis results are used to evaluate these spectra variations, with some doubt with respect to spectrum MISC10.

TABLE 5-6

EFFECT OF MISCELLANEOUS SPECTRA VARIATIONS ON CRACK GROWTH

| | | $\Delta N = F$ (a = 0.03 \rightarrow | | $\frac{R_{\Delta N}}{\left(\frac{\Delta N_{TEST}}{}\right)}$ | $\mathbf{R'}_{\Delta N} = \left(\begin{array}{c} \mathbf{R'}_{\Delta N} \end{array} \right)$ | $\frac{\Delta N_{VAR}}{\Delta N_{BS}}$ |
|------------|---|--|--------|--|---|--|
| SPECTRUM | DESCRIPTION | ANAL. | TEST | (ANAL.) | ANAL. | TEST |
| BS1 | BASELINE SPECTRUM | 16,255 | 15,365 | 0.95 | - | - |
| BS1.MISC7 | EFFECT OF LOAD ALLEVIATION SYSTEM | 15,393 | | | 0.95 | |
| BS1.MISC9 | DIFFERENT SEQUENCE OF CYCLES WITHIN A FLIGHT | 12,721 | 10,265 | 0.81 | 0.78 | 0.67 |
| BS3 | BASELINE SPECTRUM, 5112 FLIGHTS | 1,124 | 1,368 | 1.22 | - | |
| BS3.MISC8 | 600 (293 FLIGHT HOURS) FLIGHT BS3 SPECTRUM | 1,127 | | | 1.00 | |
| BS6 | BASELINE SPECTRUM; 2500 FLIGHT HOURS; FLIGHT LOADS AVERAGING INTERVAL Δg = 0.10 | 4,212 | 4,140 | 0.98 | - | - |
| BS6.MISC1 | FLIGHT LOADS AVERAGING INTERVAL Δg = 0.05 | 4,229 | | | 1.00 | |
| BS6.MISC2 | FLIGHT LOADS AVERAGING INTERVAL Δ_g = 0.20 | 2,179 | 2,937 | 1.35 | 0.52 | 0.71 |
| BS6.MISC3 | 250 FLIGHT HOUR BS6 SPECTRUM | 4,239 | | | 1.01 | |
| BS6.MISC4 | 500 FLIGHT HOUR BS6 SPECTRUM | 4,248 | | | 1.01 | |
| BS6.MISC5 | 1,250 FLIGHT HOUR BS6 SPECTRUM | 4,222 | | | 1.00 | |
| BS6.MISC6 | SIMPLIFIED BS6 SPECTRUM | 5,029 | 4,298 | 0.85 | 1.19 | 1.04 |
| BS6.MISC10 | NO TAXI, LANDING IMPACT OR GAG CYCLES | 4,848 | | | 1.15 | |

Load Alleviation System (Spectrum BS1.MISC7) — Use of flight loads alleviation system on an existing airplane to reduce design loads because of increase in design gross weight, without adding material, would have the tendency of increasing the flight 1.0g stresses and decreasing the incremental stress ($d\sigma$ /dLF). This situation was simulated by increasing the 1.0g stresses on the average of 14 percent and decreasing the incremental stresses by an average of 10 percent. The net result was only 5-percent life decrease indicating that the two parameter changes were almost self-canceling with respect to crack growth.

Cycle Sequence in Flight (Spectrum BS1.MISC9) — All maneuver and gust stress cycles of a flight, as developed on a segment-by-segment basis for the baseline spectrum, were combined into one segment from which the random sequence of valleys and peaks was picked. In effect, this spectrum variation eliminated the natural order of flight segments. The effect is a decrease in life, not very significant, but nevertheless consistent in analysis (22 percent) and test (33 percent) to recommend avoidance of such simplification.

Spectrum Length (Spectra BS3.MISC8 and BS6.MISC3 through MISC5) — The baseline spectra repeatable sequence of 2500 flight hours, which is one-tenth of the required service life for the

airplane, were decreased to one-hundredth, one-fiftieth and one-twentieth of the service life. There was no effect on crack growth.

Loads Averaging Interval (Spectra BS6.MISC1 and MISC2) — The maneuver and gust incremental load factor averaging interval of $\Delta g = 0.10$ in the baseline spectrum was changed to $\Delta g = 0.05$ and 0.20. Decreasing the interval to 0.05 made no effect on crack growth. Increasing the interval to 0.20 produced a substantial effect, a 48-percent decrease in life by analysis (29 percent by test). The $\Delta g = 0.10$ interval appears to be a good value to use.

Simplified Spectrum (Spectrum BS6.MISC6) — The baseline spectrum was simplified into a flight-by-flight spectrum with a reduced number of loading conditions and the cycles within a flight sequenced in a lo-hi-lo block spectrum. For more details see Section 2.3.12. The spectrum equivalence was good (19 percent increase in life by analysis, only 4 percent by test), indicating that such equivalencing can be used where practical.

Elimination of Ground and GAG Cycles (Spectrum BS6.MISC10) — What effect do the ground compression and GAG cycles have on crack growth? It was shown in other tests (Spectra BS6.LLT5, BS6.CLP3) that compression cycles decreased life. However, analysis does not show this effect. Removal of the GAG cycles is expected to increase the life. This expectation is borne out; analysis shows a 15-percent increase. A final answer for this situation could come only from experimental results, although a 15-percent contribution to the crack growth by the GAG cycle has been found from experiments, Reference 10, to be a representative value.

5.2.11 Combined Variations

Thirteen combined variation spectra, where more than one spectrum parameter is varied, were generated. Analysis and test results are presented in Table 5-7. Analysis verification must be done on a case-to-case basis.

Valley/Peak Coupling and Range Truncation (Spectra BS6.COMB1 and COMB2) — With respect to the baseline spectrum, VPC was changed from random to restricted and RT from 4000 to 3500 and 3000 psi. Since no tests were run from this group, analysis verification and, in general, evaluation of these results must be made with reference to the previously discussed individual variation results. The effect of changing the VPC from random to restricted was a small reduction (9 percent) in life, see Section 5.2.6. Reduction of RT level to 3500 and 3000 psi produced 16- and 25-percent reduction in life, see Section 5.2.7. In both variations analysis results were verified by test results. The combined variation effects of 29 and 33 percent in life reduction are not very significant and are approximated by the sum of the effects of the individual variation (25 and 34 percent).

Design Stress Level and Range Truncation (Spectra BS6.COMB3 through COMB6) — There is good correlation between the analysis and the test results. The combined effects are significant,

TABLE 5-7
EFFECT OF COMBINED VARIATIONS SPECTRA
ON CRACK GROWTH

| | | | | △N = FLT HR | THR | RAN | R'A= | ANVAR |
|------------|--|--|------------------------|---|----------|----------|--------|---------|
| | | | | $(a = 0.03 \rightarrow 0.53 \text{ IN.})$ | .53 IN.) | (ANTEST) | D) ND | ANBS6 / |
| SPECTRUM | DE | DESCRIPTION | | ANAL. | TEST | DNANAL. | ANAL. | TEST |
| BS6 | BASELINE SPECTRUM: VPC = RANDOM, RT = 4000 PSI, TEN HIGHEST PEAKS = 21,465 → 23,923 PSI | : VPC = RANDOM, RT = 21,465 → 23,923 PSI | r = 4000 PSI, | 4,212 | 4,140 | 0.98 | ĺ | 1 |
| BS6.COMB1 | VALLEY/PEAK COUPLING (RESTRICTED) | 3 (RESTRICTED) | RT = 3500 PSI | 2,990 | | | 0.71 | |
| BS6.COMB2 | RANGE TRUNCATION | | RT = 3000 PSI | 2,830 | | | 0.67 | |
| BS6,COMB3 | | MF = 1.15, RT | = 3500 (1.15) | 1,900 | 2,438 | 1.28 | 0.45 | 0.59 |
| BS6.COMB4 | DESIGN STRESS LEVEL AND | MF = 1.15, RT | = 3000 (1.15) | 1,797 | | | 0.43 | |
| BS6.COMB5 | KANGE IRONCATION | MF = 0.9, RT = | = 4500 (0.9) | 6,874 | | | 1.63 | |
| BS6,COMB6 | | MF = 0.9, RT = | = 0.9, RT = 3500 (0.9) | 5,260 | 5,290 | 1.01 | 1.25 | 1.28 |
| BS6.COMB7 | HIGH INFREQUENT | TEN HIGHEST PEAKS: | r PEAKS: | 3,219 | | | 0.76 | |
| BS6.COMB8 | TRUNCATION (3500 PSI) | TEN HIGHEST PEAKS: 27,750 PSI AND n = 200 | r PEAKS: ID n = 200 | 3,286 | | | 0.78 | |
| BS6.COMB12 | | TEN HIGHEST PEAKS: SAME AS BS6, n = 100 | r PEAKS: , n = 100 | 3,344 | 3,522 | 1.05 | 0.79 | 0.85 |
| BS6.COMB9 | DESIGN STRESS LEVEL AND HIGH | N HIGHEST | MF = 1.15 | 2,421 | | | 0.57 | |
| BS6.COMB10 | PEAKS = 27,750 PSI AND n = 200) | n = 200) | MF = 0.74 | 13,584 | | | 3.23 | |
| BS6.COMB11 | NO GROUND OR GAG CYCLES, FLIGHT 1.0 g STRESS = 0, STRESSES INCREASED 100 PERCENT | CLES, FLIGHT 1.0 | g STRESS = 0, | *836 | 12,922* | 2.67* | 2.20* | 6.65* |
| BS6.COMB13 | SPECTRUM BS6.COMB11 WITH 35 PERCENT HIGHER STRESSES | WITH 35 PERCENT | . HIGHER | 873** | 2,908* | 3.33* | 0.84** | 2.60** |
| | | | | | | | | |

*a = 0.03 → 0.188 IN.

^{**}a = 0,213 →0,372 IN.

with life increases or decreases up to 63 percent. The effect of range truncation is similar at the two design stress levels (MF = 1.15 and 0.9) as for the baseline spectrum (MF = 1.0):

| | $(R'_{\Delta N})$ | $(R'_{\Delta N})_{ANAL} = (\Delta N_{VAR}/\Delta N_{BS})$ | | | | |
|----------|-------------------|---|-----------|--|--|--|
| RT (PSI) | MF = 0.9 | MF = 1.0 | MF = 1.15 | | | |
| 4500 | 1,05 | 1,06 | | | | |
| 4000 | - | - | - | | | |
| 3500 | 0,81 | 0,84 | 0,78 | | | |
| 3000 | | 0.75 | 0.74 | | | |

High Infrequent Loads and Range Truncation (Spectra BS6.COMB7, COMB8, and COMB12) — There is good correlation between the analysis and the one test result, BS6.COMB12. However, the test result does not appear to follow the trends established in the individual variation tests. Effect of HIL was to increase the life, and there was no correlation between test and analysis results, see Section 5.2.8. The effect of lowering the RT from 4000 to 3500 psi is to decrease the life, see Section 5.2.7. However, this decrease is much lower than the increase due to HIL, so that the expected trend in these combined variations would be an overall increase in life. Is this just scatter in test data or a loading interaction effect not well understood and of course not accounted by the linear analysis? The loading interaction effect might be, as discussed in Section 5.2.7, a decreased retardation due to having less frequent retarding peaks in terms of the number of cycles between these peaks. As a consequence of these observations, no conclusions are made about the results in this group. More refined analysis and confirmation of the test result are needed.

Design Stress Level and High Infrequent Loads (Spectra BS6.COMB9 and COMB10) — In view of the noncorrelation of HIL effect by analysis (Section 5.2.8), analysis results of this group are also considered to be unverified. The analysis results only reflect the effect of the DSL changes, similar as in the individual variations, see Section 5.2.5.

Highly —R Value Spectrum (Spectra BS6.COMB11 and COMB13) — These spectra are drastically different from all the previous spectra. The basic features of these spectra are: no taxi, landing impact, or GAG cycles; flight 1.0g stresses set to zero and then the stresses increased 100 and 135 percent. Almost all cycles have a negative stress ratio R. The spectrum does not represent the wing loading. It can be viewed, in general terms, and not specifically with respect to the C-15 aircraft, as an example of a vertical tail spectrum. There is no correlation between test and analysis results. Test life is very significantly longer, in the vicinity of 300 percent. With respect to the wing baseline spectrum BS6, life is very significantly longer by a factor of 6.65 and 2.60 for the two spectra. Note that the crack lengths over which the comparisons are made for these spectra are shorter than for the other spectra, approximately 0.15 versus 0.50 inch.

SECTION 6

SUSTAINED COMPRESSION AND FASTENER EFFECTS

This section contains the interpretation of experimental results on the effect of sustained compression loadings and of fasteners in holes on crack growth under spectrum loading.

6.1 SUSTAINED COMPRESSION LOADING

Many aircraft structures in service are subjected to sustained compression loadings (SCL). The wing lower surface, which is the structure selected for this program, is a prime example of such loading while the aircraft is on the ground. Evidence (Reference 7) of life-shortening effects of such loadings on the fatigue life under constant amplitude loading prompted the experimental crack growth investigation described in Section 4.3.

Crack growth tests were performed on five specimens loaded by a random cycle-by-cycle, flight-by-flight C-15 wing lower surface spectrum. The test represented 4000 flight hours and flights of loading. Two of the specimens were subjected to sustained compression loading, represented by the 1.0 g preflight ground stress, for 297 out of 344 hours of test duration. Each specimen was designed to have three through-the-thickness cracks: a crack out of an open hole, a crack out of a hole with a neat fit fastener, and a crack at the edge of specimen. However, in precracking, not all cracks initiated at the same time and consequently, not all of the test data is usable for comparative evaluation. For further details of the experimental program and results see Section 4.3 and Table C-36.

The experimental data which is directly comparable is shown in Figure 6-1. The comparisons show (see Figure 6-2) that on the average, the crack out of the hole with the fastener, in 4000 flight hours, propagated only 2.8 percent faster when the SCL were applied. Similar comparison of crack growth out of an open hole, over shorter lifetimes, indicates the opposite trend; the SCL reduced crack growth by about 14 percent. Within the scope and scatter of this experimental data, it must be concluded that there is no significant effect of sustained compression loading on crack growth under a realistic spectrum loading.

6.2 FASTENER EFFECT

What effect does a fastener in a hole have on the growth of a crack out of the hole? In real structures the effect is a function of several factors: amount of interference, torque-clamping force, and bearing load. However, what is the effect in the most simple case if the above factors, except a neat fit straight-shank fastener with no torque applied (no head or nut), are eliminated? Stress intensity factor K solution, based on finite element analysis, for this simple case indicates (Reference 8, Figure 16) a reduction in K up to (a/r) = 0.3. To check this simple case, two

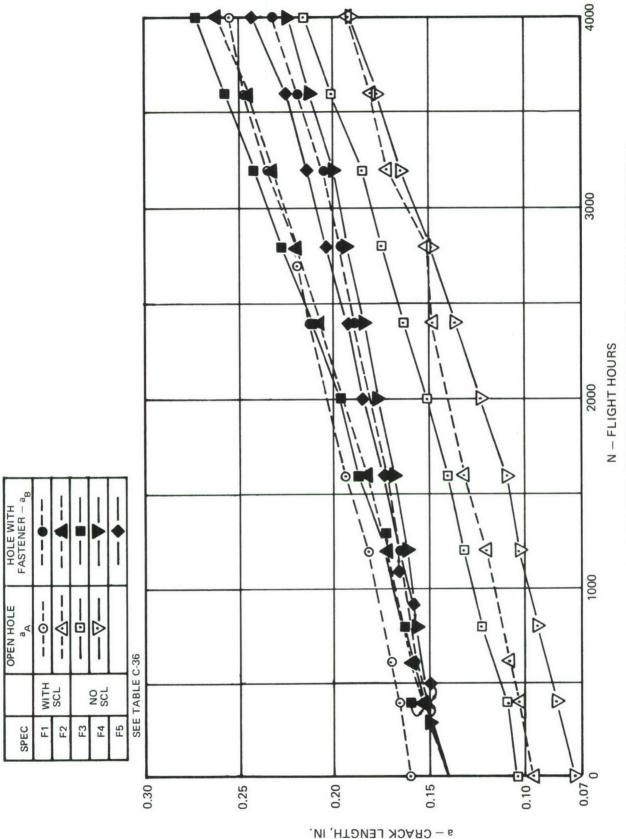


FIGURE 6-1. CRACK GROWTH UNDER SPECTRUM LOADING WITH AND WITHOUT SUSTAINED COMPRESSION LOADING

MATERIAL: 7475-T7651, t = 0.25 IN. THE AMOUNT (Δa) THAT A THRU-THE-THICKNESS CRACK ON ONE SIDE OF A HOLE GREW IN ΔN FLIGHT HOURS OF SPECTRUM LOADING, STARTING WITH CRACK LENGTH a_1 :

| VER OPEN HOLE | 0 0.140 0.104 0.160 000 2,700 1,100 | Δa _A 0.05 Aa _A 0.05 F2 F3 F4 NO SCL | 0.068 0.079 0.031 0.036 | iCL/∆a NO SCL): | 0.861 |
|--------------------|--|--|--------------------------------|---|----------|
| HOLE WITH FASTENER | a_i (IN.) = 00. ΔN (FLTS) = 4,000 | 0.15 Δa _B 0.05 - SPECIMEN: F1 F2 F3 F4 F5 SCL SCL | AVE $\Delta a = 0.109 \ 0.106$ | RATIO = $(\Delta a \text{ WITH SCL}/\Delta a \text{ NO SCL})$: | AVE 1028 |

EFFECT OF SUSTAINED COMPRESSION LOADING (SCL) ON CRACK GROWTH UNDER SPECTRUM LOADING FIGURE 6-2.

specimens (A1 and A2) in the spectrum variation test series had a titanium Hilok fastener installed in one of the holes, neat fit (0.0001-inch clearance), no head or nut. The starting point of (a/r) in these tests was (0.03/0.125) = 0.24. According to the above-mentioned stress intensity factor solution, the effect of the fastener at this crack length is less than 5 percent. Figure 6-3 shows specimen A1 and A2 test results, with the comparison of crack growth out of a hole with and without a fastener. Comparison of crack growth lives, over comparable crack lengths, shows the following:

| SPECIMEN | a(IN.) | OPEN HOLE | FILLED HOLE | $rac{ m N_{FILLED}}{ m N_{OPEN}}$ |
|----------|---------------|--------------|----------------|------------------------------------|
| A1 | 0.132 - 0.53 | 2710 | 3678 | 1.36 |
| A2 | 0.036 + 0.353 | 3100 | 6017 | 1.94 |

Comparison of specimen A1 data is only up to a = 0.53 inch, because of the cracking assumed to have started on the other side of the open hole after this point, whereas there was no cracking on the other side of the filled hole. The comparison shows a large slowdown in crack growth due to the presence of a neat fit pin in the hole. This is a much larger effect than any available stress intensity factor solution would indicate. The smaller effect in specimen A1 is attributed to the longer initial crack length. A similar comparison can be made with the sustained compression loading test data of Figure 6-1:

| SPECIMEN | a(IN.) | OPEN HOLE | FILLED HOLE | $\frac{\mathrm{N_{FILLED}}}{\mathrm{N_{OPEN}}}$ |
|----------|---------------|--------------|----------------|---|
| F1 | 0.160 - 0.232 | 3125 | 3191 | 1.02 |
| F2 | 0.140 - 0.193 | 2000 | 1920 | 0.96 |
| F3 | 0.140 - 0.216 | 2400 | 2525 | 1.05 |
| F4 | 0.140 - 0.192 | 1467 | 2756 | 1.88 |

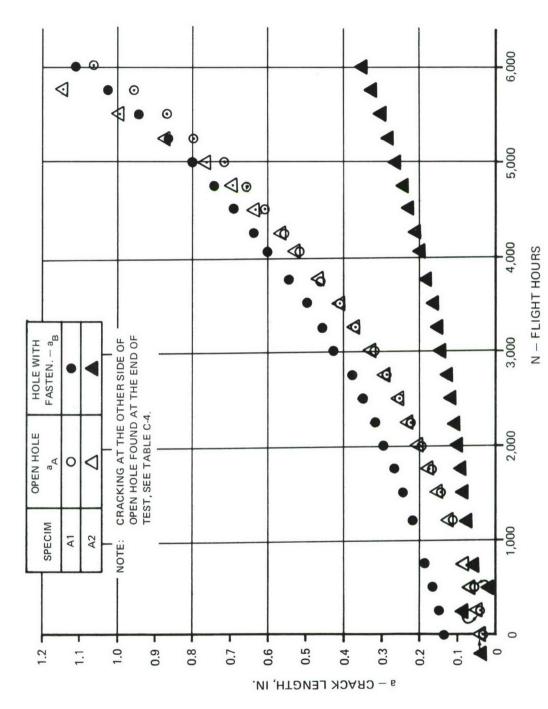


FIGURE 6-3. EFFECT OF FASTENER IN HOLE ON CRACK GROWTH, SPECTRUM BS6

Here, in three out of four specimens the pin showed very little effect. In the fourth specimen, the effect was a substantial reduction in crack growth rate, similar to the previous data. The large differences and lack of crack growth rate reduction in three of the tests may be attributed to scatter and the longer initial cracks.

Additional test data on this subject are available from Reference 9. These data are presented here to clarify the findings of this program. The specimens were 9.0-inch-wide panels with a 1/4-inch-diameter hole with a 0.05-inch (0.12-inch-deep) corner precrack. Two materials were tested: 2024-T351 bare plate and 7075-T651 plate machined from an extrusion, both 0.25 inch thick. The titanium Hilok was installed neat fit with a resulting interference between 0.0001 and 0.0002 inch. The spectrum was a transport/tanker (KC-10A) wing lower surface random cycle-by-cycle, flight-by-flight loading sequence. Tests were performed with three different spectra with the range truncation (RT) being the variable. The results:

| MATERIAL | SPECTRUM RT (PSI) | a(IN.) | $rac{ m N_{FILLED}}{ m N_{OPEN}}$ |
|----------|----------------------|---------------------------|------------------------------------|
| 2024 | 3000 | $0.048 \div 0.415$ | 2.34 |
| 2024 | 3600 | $0.053 \div 0.577$ | 2.55 |
| 2024 | 4200 | $0.054 \div 0.574$ | 1.70 |
| 7075 | 3000 | $0.052 \rightarrow 0.572$ | 1.30 |
| 7075 | 3600 | $0.053 \rightarrow 0.579$ | 1.89 |
| 7075 | 4200 | $0.052 \rightarrow 0.572$ | 1.40 |

These results definitely indicate that the installation of a neat fit pin in a hole results in a significant reduction of the crack growth rate of a crack out of the hole. This reduction is greatest at short cracks, but is still prevalent even at a > 0.5 inch, see Figure 6-4.

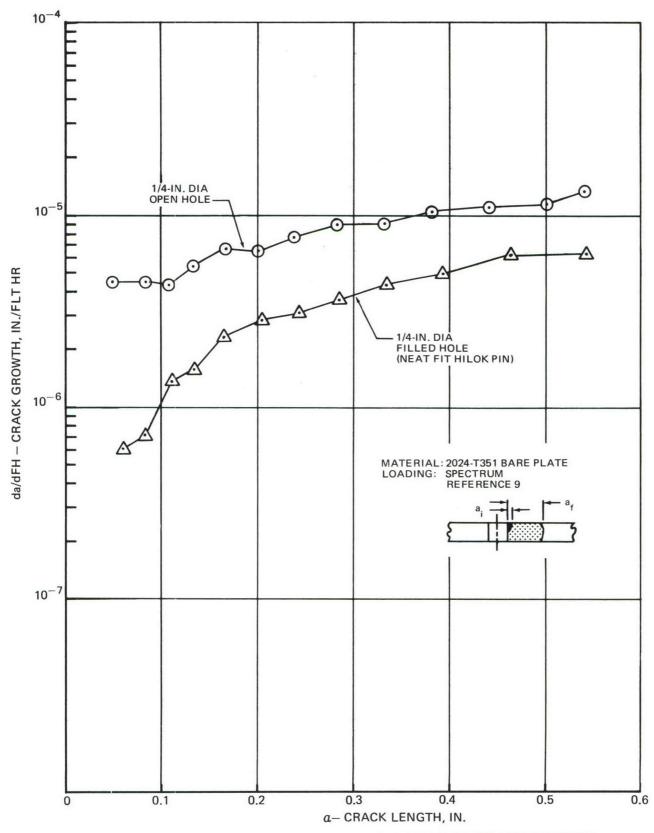


FIGURE 6-4. EFFECT OF NEAT FIT PIN IN A HOLE ON CRACK GROWTH OF A CRACK OUT OF THE HOLE

SECTION 7

SUMMARY AND RECOMMENDATIONS

The program consisted of generating 116 spectrum variations of a baseline spectrum representing a transport wing lower surface loading. The loading was modeled for the C-15 advanced medium STOL aircraft. The effect of these variations on crack growth was established analytically and experimentally using a crack growing out of a 1/4-inch-diameter hole in 7475-T7651 aluminum alloy 0.25-inch-thick plate. Analysis and experimental data were produced to represent 1.0 inch of cracking, starting with a through-the-thickness crack of 0.03 inch. The first half inch of this cracking was used to evaluate the spectrum variation effects.

In addition to the above major part of the program, experiments were performed to determine the effect of sustained compression loading and fasteners in holes on crack growth

This section presents a summary of the findings of this program and recommendations for the development of loads spectra for transport/bomber aircraft.

7.1 CRACK GROWTH PREDICTION

As designated at the outset of the program, the analysis crack growth prediction model was to be chosen on the basis of the baseline spectrum test results. This procedure resulted in the selection of the linear model as opposed to models with retardation features. Subsequent analysis of the other 32 spectra which were tested showed good correlation between analysis and test results for all categories of spectra variations with the exception of variations on high infrequent loads and spectra which were drastically changed from a wing spectrum to a spectrum representative of the vertical tail. For the majority (73 percent) of spectra the analysis prediction was conservative, i.e., faster crack growth than test data. In 73 percent of the cases the test results were within \pm 30 percent of analysis.

The spectrum loading interaction effects are exhibited in the form of crack growth retardation and acceleration phenomena. The baseline spectra test results correlated well with linear analysis results because the retardation and acceleration features of the spectrum canceled each other. The highest peak in the 2500-flight-hour baseline spectrum was 23,923 psi or 69 percent of the design limit stress. Test results reflect the following:

- 1. Retardation Produced by increased magnitude and frequency of high infrequent loads.
- 2. Acceleration Due to compression loads and increase in the number of compression-compression cycles. The effect was not as large as the retardation due to high infrequent loads. Also, acceleration is assumed to exist during high-loading cycles following low-loading cycles.

7.2 EFFECT OF SPECTRA VARIATIONS ON CRACK GROWTH

The 116 spectra variations were divided into 13 categories. A summary of the effect of these variations on crack growth within each category is presented in Table 7-1. The effects of these variations are classified as not significant, significant or very significant on the basis of the crack growth variation with respect to the baseline or a reference spectrum being less than 20 percent, between 20 and 100 percent, and more than 100 percent. The classification is arbitrary. It is simply a relative classification of the effects on crack growth. Note that the life in this evaluation is measured in terms of flight hours. Flight hour is considered to be the most common parameter used in keeping track of transport and bomber aircraft life. Use of any other parameter, such as landings, could produce in some instances a different interpretation of the results. The evaluation is based on analysis results with the exception of those cases where analysis results were not verified by the test results. The spectrum categories in each of the three classifications are:

Not Significant:

- SEQUENCE OF MISSIONS. Negligible effect of having different random or ordered sequences of individual flights.
- FLIGHT SEGMENTS. Reduction of the number of climb and descent gust segments, application of cruise segment load factor-stress transfer function to climb and descent segments or elimination of landing impact cycles produced small effect.
- LOW LOAD TRUNCATION. COMPRESSION LOADS. Decreasing the number of compression-compression taxi cycles from 25.9 to 3.5 per landing increased life 18 percent. This is a test result. Analysis shows no effect in varying the number of compression-compression cycles in the spectrum.
- LOAD ALLEVIATION SYSTEM. Simulation of a load alleviation effect on flight loads (14-percent increase in 1.0g stresses and 10 percent decrease in incremental stresses) produced only a 5-percent decrease in life.
- SPECTRUM LENGTH. Negligible effect resulted from the variation in the repeatable spectrum length from 2500 to 293 flight hours, where 2500 flight hours are one-tenth of required service life.
- SIMPLIFIED SPECTRUM. Simplification of the random spectrum into an equivalent flight-by-flight spectrum, with a lo-hi-lo block cycle arrangement within a flight, produced good correlation with the random spectrum, only a 4-percent increase in life (test result).
- NO GROUND OR GAG CYCLE. Elimination of ground compression and GAG cycles produced only a 15-percent increase in life (analysis result).

TABLE 7-1
EFFECT OF SPECTRA VARIATIONS ON CRACK GROWTH — SUMMARY

| | | | | | LEVEL O | LEVEL OF EFFECT ON CRACK GROWTH | GROWTH |
|---|-------------------|------------------|--|---|---|---|------------------------------|
| | | | $R'_{\Delta N} = (\Delta N)$ | $I = (\Delta N_{VAR}/\Delta N_{BS})$ ($\Delta N = FLT HR$, | $\Delta R'_{\Delta N} < 0.2$ | $\Delta N'$ HIGH -1 $\Delta N' = 1$ $\Delta N'$ HIGH -1 $\Delta N' = 1.0$ | $\Delta R'_{\Delta N} > 1.0$ |
| SPECTRUM VARIATION | NO. OF SPECTRA | NUMBER TESTED | a = 0.03 → ANAL | = 0.03 → 0.53 IN.) NAL TEST | NOT | SIGNIFICANT | VERY |
| | | | | | | | |
| BASELINE SPECTRA (BS) | 9 | 9 | 0.27 → 18.60 | 0.33 → 16.19 | | | × |
| MISSION MIX (MM): AMOUNT OF TRAINING LOW ALTITUDE PENETRATION TIME | 14 (4) (3) | 2 (1) (2) | $0.26 \rightarrow 8.01$ (0.71 \rightarrow 1.13) (0.27 \rightarrow 3.43) | 0.96 → 3.78 (0.96) (0.33 → 3.78) | | × | ×× |
| SEQUENCE OF MISSION (SM) | 4 | 0 | 0.96 → 1.01 | 1 | × | | |
| INDIVIDUAL FLIGHT LENGTH (FL) | 9 | 1 | 1.66 → 21.43 | 7.90 | | | × |
| FLIGHT SEGMENTS (FS) | 5 | 0 | 0.99 → 1.14 | 1 | × | | |
| EXCEEDANCE SPECTRA (ES) | 4 | 1 | 0.66 → 1.66 | 1.93 | | × | |
| DESIGN STRESS LEVEL (DSL) | 10 | 3 | 0.33 → 3.66 | 0.42 → 3.21 | | | × |
| VALLEY/PEAK COUPLING (VPC) | 9 | 1 | 0.78 → 0.95 | 0.91 | | × | |
| LOW LOAD TRUNCATION (LLT): RANGE TRUNCATION (RT) TAXI CYCLES | 14 | 4 + | 0.72 → 1.09 1.00 → 1.00* | 0.60 → 1.28 0.85 | × | × | |
| HIGH INFREQUENT LOADS (HIL) | 18 | 5 | 0.81 → 1.00* | 1.19 → 2.37 | | | × |
| CLIPPING LARGE LOADS (CLP) | 4 | 1 | 1.00 → 1.06* | 1.37 | | × | |
| MISCELLANEOUS (MISC): LOAD ALLEVIATION SYSTEM CYCLE SEQUENCE IN FLIGHT SPECTRUM LENGTH LOADS AVERAGING INTERVAL SIMPLIFIED SPECTRUM | 40 | 0-00 | 0.95 0.78 1.00 \rightarrow 1.01 0.52 \rightarrow 1.00 1.19 | 0.67 | × × ×× | × × | |
| COMBINED (COMB): VPC + RT DSL + RT HIL + RT DSL + HIL VERTICAL TAIL SPECTRUM | 2482 | 20 - 1 2 0 | $0.67 \rightarrow 0.71$ $0.43 \rightarrow 1.63$ $0.76 \rightarrow 0.79*$ $0.57 \rightarrow 3.23*$ $0.84 \rightarrow 2.20*$ | 0.59 \to 1.28 0.85(?) - 2.60 \to 6.65 | | ××× | ×× |
| TOTAL | 116 | 33 | *ANALYSIS | S RESULTS NOT | *ANALYSIS RESULTS NOT VERIFIED BY TEST RESULTS. | T RESULTS. | |

Significant:

- MISSION MIX AMOUNT OF TRAINING. Variation in the percentage of the total time spent in training produced relatively small variation (29 percent) in life when measured in flight hours. However, if life is measured in landings, then the effect appears to be much more significant. For example, an almost five-fold increase in number of landings when going from the baseline spectrum (20.4-percent time in training) to 100-percent training with touch-and-go landings only.
- EXCEEDANCE SPECTRA. Increasing or decreasing the number of cycles of flight loads by 15 percent produced approximately the same percentage decrease and increase in life. However, variation of the flight loads exceedance curve slopes by 15 percent produced life changes up to 66 percent.
- VALLEY/PEAK COUPLING. The random valley/peak couplings in the six baseline spectra were changed to a restricted coupling. In five of the six spectra the effect was small, a decrease in life up to 9 percent, but in spectrum BS5 the decrease was 22 percent.
- LOW LOAD TRUNCATION RANGE TRUNCATION. Life reduction of close to 50 percent was observed when the range truncation level was lowered from 4000 psi in the baseline spectra toward 2000 psi in the variations at the expense of a six-fold increase in the number of cycles in the spectrum. An optimum truncation level appears to be around 2250 psi.
- CLIPPING LARGE LOADS. Analysis showed no effect when tension loads were clipped. In view of other test results, a decrease in life is expected due to this variation. Clipping all the loads below zero (excluding compression) produced a 37-percent increase in life (test result).
- CYCLE SEQUENCE IN FLIGHT. The cycles within a flight were chosen at random from any flight segment, without regard to the normal sequence of flight segments. The result (test) was a 33-percent decrease in life.
- LOADS AVERAGING INTERVAL. The averaging interval of the incremental load factors in the exceedance spectra of the baseline spectra was $\Delta g = 0.10$. The variations were generated with $\Delta g = 0.05$ and 0.20. Use of $\Delta g = 0.05$ produced no effect. Use of $\Delta g = 0.20$ resulted in 48 percent decrease in life. Use of $\Delta g = 0.10$ in transport/bomber spectra development is recommended.
- COMBINED VARIATIONS. Combined variations of valley/peak coupling, design stress level, and high infrequent loads with different range truncation level than the 4000 psi of the baseline spectra produced life variations with changes up to 63 percent. Variation involving HIL was not verified.

Very Significant:

- BASELINE SPECTRA. Baseline spectra, consisting of individual missions as compared to the composite mission mix spectrum BS6, produced variations from a 73-percent decrease to an almost 19-fold increase in life.
- MISSION MIX. Different mission mixes, including individual flights, produced large life variations, ranging from a 74-percent decrease to an eight-fold increase in life. The mission with the largest influence on crack growth was Mission 3 which is exclusively composed of low-altitude penetration flying. Variation of this flying time in a mission mix from zero to 100 percent produces almost a 13-fold decrease in life.
- INDIVIDUAL FLIGHT LENGTH. Variation of Mission 1 flight lengths from approximately 0.5 to 4.0 hours produced up to five-fold increase in life. However, if life is measured in terms of landings, this increase in flight length reduces life only up to 30 percent, indicating that the crack growth per flight is not very sensitive to flight length when other factors are held constant or adjusted to reflect the flight length.
- DESIGN STRESS LEVEL. Changing the loads spectrum by multiplying all the streses in the spectrum can be viewed as the effect of basic change in design stress level or change in usage severity. Decreasing the stresses by 26 percent or increasing by 35 percent produced a life increase of at least 266 percent and a decrease of at least 67 percent.
- HIGH INFREQUENT LOADS. Increase of the magnitude and/or frequency of the 10 highest peaks in the baseline spectra produced retardation effects which increased life up to 137 percent. Linear analysis did not account for this effect.
- COMBINED VARIATION DESIGN STRESS LEVEL AND HIGH INFREQUENT LOADS. The large effect on crack growth life, from 43-percent decrease to 223-percent increase, established by analysis, represents only a partial effect, since analysis does not account for the HIL variation effect.
- VERTICAL TAIL SPECTRUM. A drastic change from a wing lower surface spectrum to one typical of a vertical tail loading produced a very large increase in life (up to 665 percent) which the linear analysis was not able to predict by a large margin.

7.3 TRANSPORT VERSUS BOMBER SPECTRA

Fatigue loads spectra vary as a function of aircraft type and its usage. Also, different parts of the aircraft experience different spectra. The study in this program was based on a transport high wing root lower surface spectrum. How applicable are the findings of this program to a bomber

wing spectrum or to any other transport or bomber structure spectrum? The varieties of spectra as a function of aircraft and structure type are too numerous to have been evaluated within the scope of this program. However, a comparison was made of several transport and bomber wing lower surface spectra for the purpose of evaluating the same structure spectra between the two types of aircraft. For general completeness, a fighter wing lower surface spectrum was also considered. The aircraft and spectra were:

| Aircraft | Spectrum | Reference |
|---------------------------------------|--|--------------|
| STOL Transport (C-15) (High Wing) | Composite mission mix, BS6, RT = 3000 and 4000 psi. Wing root. | This Program |
| Tanker-Cargo (KC-10A) (Low Wing) | Composite mission mix, RT = 2250 psi. Outboard of main landing gear. | 9 |
| Fighter (F-15) | Composite mission mix baseline. Wing mid-span. | 3 |
| Bomber (B-1) (Variable Sweep Wing) | Center wing and wing root. | 11, 12 |
| Bomber (B-52) (High Wing) | Test spectrum. Wing mid-span. | 13 |

The spectra represent different types of wings: high wing with main landing gear in fuselage, low wing with main landing gear in wing, and variable sweep wing with main landing gear in the fuselage. Location of the landing gear influences the magnitude of the ground stresses. Landing gear in the fuselage means higher compression stresses.

Wing lower surface spectrum cycles can be grouped into flight, ground, and ground-to-air transition (GAG) cycles. Stress ratio (R) and peak distribution of the flight loads cycles are compared in Figures 7-1 and 7-2. Noting that some of the differences between these spectra are due to different methods of spectrum generation and truncation, and in the case of the B-52 spectrum, simplifications for a test spectrum, transport and bomber spectra are considered to be similar as opposed to the fighter spectrum. Stress ratios (R) of most cycles in the transport and bomber spectra fall between 0.6 and 0.8 whereas in the fighter spectrum the Rs are distributed approximately evenly between 0.0 and 0.8. The distribution of peak loads with respect to the highest peak in the spectrum shows similar trends for all spectra with most cycles falling in the 40 to 60 percent of the highest peak interval. Some deviations from this general observation, in the case of the B-52 and B-1 (center wing), are attributed to simplification of the B-52 spectrum for testing purposes and the effect of the variable wing sweep on the B-1 center wing. However, the highest peak in the spectrum, when considering aluminum alloys only, is significantly higher in

the fighter spectrum (over 30,000~psi) than for transport and bomber spectra (approximately 20,000~to~24,000~psi).

The magnitude of the ground cycles, and indirectly of the GAG cycles, depends on the location of the landing gear, usually related to the type of the wing (high or low), and the spanwise location represented by the spectrum. Transport and bomber ground stresses tend to be higher in compression than for fighter spectra. This produces higher negative R GAG cycles in transport and bomber spectra than in fighter spectra.

In conclusion, limiting ourselves to the wing lower surface, it can be stated that the transport and bomber spectra are similar and the findings of this program are applicable to both types of aircraft.

| AIRPLANE | | |
|---|--------------------------------|---|
| STOL TRANSPORT (C-15) | RT = 3000 PSI RT = 4000 PSI | |
| TANKER - CARGO (KC-10A) FIGHTER (F-15) | RT = 2250 PSI | 300000000000000000000000000000000000000 |
| BOMBER (B-1) | CENTER WING WING ROOT | (IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII |
| BOMBER (B-52) | | |

*LESS THAN 1 PERCENT NOT SHOWN

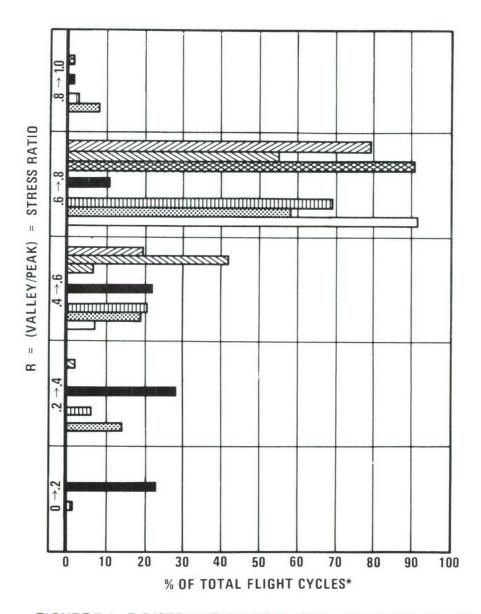


FIGURE 7-1. R DISTRIBUTION OF FLIGHT LOADS CYCLES FOR VARIOUS AIRPLANE TYPES, WING LOWER SURFACE

| AIRPLANE | |
|-------------------------|--------------------------------|
| STOL TRANSPORT (C-15) | RT = 3000 PSI RT = 4000 PSI |
| TANKER - CARGO (KC-10A) | RT = 2250 PSI |
| FIGHTER (F-15) | |
| BOMBER (B-1) | CENTER WING WING ROOT |
| BOMBER (B-52) | |

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| MATERIAL | HIGHEST PEAK, PSI |
|-----------|----------------------|
| WATERIAL | FEAR, FSI |
| 7475 ALUM | 23,923 |
| 2024 ALUM | 19,914 |
| 7075 ALUM | 30,420 |
| 6A-4V Ti | 51,842 |
| 2219 ALUM | 21,660 |
| 2024 ALUM | 24,200 |

*LESS THAN 1 PERCENT NOT SHOWN

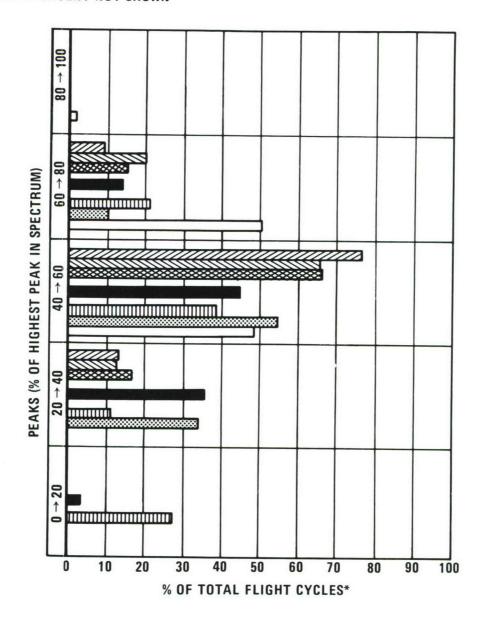


FIGURE 7-2. PEAK DISTRIBUTION OF FLIGHT LOADS CYCLES FOR VARIOUS AIRPLANE TYPES, WING LOWER SURFACE

7.4 SUSTAINED COMPRESSION EFFECT ON CRACK GROWTH

Crack growth tests were performed to check the effect of sustained compression loading (SCL) on crack growth under representative spectrum loading conditions. In the case of the wing lower surface, the SCL is viewed as representing the loading while the airplane is stationary on the ground.

The test showed no significant effect of the SCL on crack growth of a crack out of a 1/4-inch-diameter hole in a 0.25-inch plate, 7475-T7651 aluminum alloy. The SCL, represented by the pre-flight 1.0g ground stress, was applied 86 percent of the time in a 344-hour test representing 4000 flight hours of spectrum loading, during which the crack was propagated approximately 0.1 inch. Cracking data were obtained from open and fastener-filled holes.

7.5 EFFECT OF A FASTENER IN A HOLE ON THE CRACK GROWTH OF A CRACK OUT OF THE HOLE

Tests with spectrum loadings were performed on open and fastener-filled (neat fit) hole specimens, 7475-T7651 material, to check the effect of the fastener on the crack growth out of the hole. The tests, substantiated by similar results with 2024 and 7075 aluminum alloys from another program, indicate a significant crack growth rate reduction due to the presence of a neat fit pin in the hole. Life to propagate a crack from a fastener-filled hole over 0.5 inch of cracking was found to be up to 2.5 times longer than for a crack from an open hole. Such magnitude effect is not predictable using presently available stress intensity solutions for cracks out of fastener-filled holes.

7.6 ESTIMATE OF CRACK GROWTH VARIATION IN A FLEET OF AIRCRAFT DUE TO LOADS SPECTRUM VARIATION.

What is the loads spectra variation in a fleet of aircraft and how much such variations affect crack growth? This question is answered here in the light of the results of this program

The variations in loads spectra can be considered as short term or long term. Short term is viewed as the variation between spectra over a short period of time, say one-tenth of lifetime or less, on the same or different aircraft in the fleet. Long term is viewed as the variation between spectra of different aircraft over a time period approaching the service life of the aircraft. Short-term variations are considered with respect to crack growth in structures with frequent inspection requirements, while the long-term variations are considered to apply to slow crack growth structures which require very few or no inspections during the lifetime of the airplane.

Of the 116 spectrum variations considered in this program, 47 are considered as representing realistic variations in a fleet of aircraft. The remaining variations were generated in order to establish spectrum development procedures. The 47 variations, listed in Table 7-2, are

considered to apply to short-term variations. Long-term variations are represented by 24 of these spectra, Table 7-2. An example of short- and long-term variations is that in the former, a spectrum based on a single flight type or mission will be considered, whereas only a mix of missions is considered in the long-term variations.

Based on the overall low and high $R'_{\Delta N}$ values given in Table 7-2 for the short- and long-term variations, the following crack growth variations can be expected in a fleet of aircraft:

| SPECTRUM | SPECTRUM CRACK GROWTH VARIATION FACTOR | | | | | |
|-------------------------|--|--------------|---------------|----------------|--|--|
| VARIATION | SHORT LIFE | BASELINE | HIGH LIFE | OVERALL | | |
| SHORT-TERM LONG-TERM | 3.85 3.03 | 1.00 1.00 | 21.43 3.06 | 82.42 11.09 | | |

In conclusion, thinking in terms of round numbers, crack growth variation overall factors of 100 and 10 appear to be appropriate numbers to express the difference between the fastest and slowest crack growth rates due to short-term and long-term spectra variations.

TABLE 7-2
SPECTRUM VARIATIONS APPLICABLE TO FLEETWIDE VARIATION

| SPECTRUM VARIATION | SHORT-TERM VARIATION | | LONG-TERM VARIATION | |
|-----------------------------------|----------------------|--------------------|---------------------|-------------|
| | NO. OF SPECTRA | R′ _{△N} * | NO. OF SPECTRA | R'_AN* |
| BASELINE SPECTRA | 6 | 0.27 → 18.60 | 0 | _ |
| MISSION MIX | 14 | 0.26 → 8.01 | 5 | 0.59 → 3.43 |
| SEQUENCE OF MISSIONS | 4 | 0.96 → 1.01 | 4 | 0.96 → 1.01 |
| FLIGHT LENGTH | 6 | 1.66 → 21.43 | 0 | |
| EXCEEDANCE SPECTRA | 4 | 0.66 → 1.66 | 4 | 0.66 → 1.66 |
| DESIGN STRESS LEVEL | 4 | 0.33 → 3.66 | 4 | 0.33 → 3.66 |
| LOW-LOAD TRUNCATION – TAXI CYCLES | 2 | 0.85 | 2 | 0.85 |
| HIGH INFREQUENT LOADS | 5 | 1.19 → 2.37 | 5 | 1.19 → 2.37 |
| COMBINED – DSL + HIL | 2 | 0.57 → 3.23** | 0 | |
| TOTAL | 47 | 0.26 → 21.43 | 24 | 0.33 → 3.66 |

^{*}ANALYSIS, EXCEPT TEST WHERE ANALYSIS NOT VERIFIED.

^{**}PARTIAL EFFECT

7.7 RECOMMENDATIONS FOR SPECTRUM DEVELOPMENT

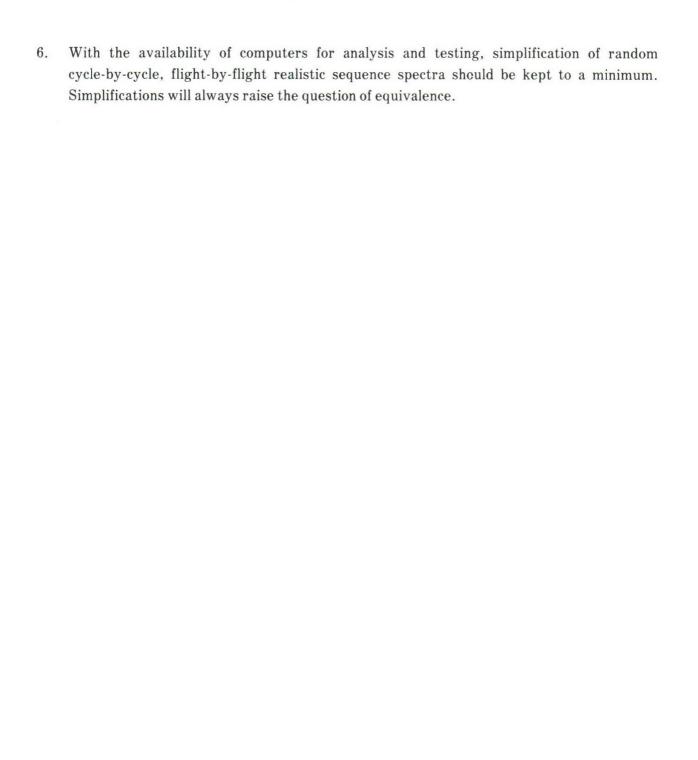
Development of a fatigue loads spectrum for a transport or a bomber aircraft is an involved process consisting of the following steps:

- 1. Definition of expected utilization and mission profiles. The utilization and mission profiles are taken to be averages.
- 2. Exceedance data of the loading environments in which the aircraft will operate. For transport and bomber aircraft, the loadings to consider are:
 - a. Ground loads taxi, takeoff run, landing rollout, landing impact, and ground maneuvers (turning, braking, pivoting, towing, steering).
 - b. Flight maneuvers, function of mission type and flight segment.
 - c. Gusts, turbulence parameters are a function of altitude.
 - d. Fuselage pressurization.

Exceedance data for these loading environments for transport and bomber aircraft are given in MIL-A-008866B. These data should be modified if not directly applicable or more reliable data are available.

- 3. Mission profiles are divided into segments. A segment is a portion of the mission profile that can be represented by average exceedance spectra and stress parameters without jeopardizing the integrity of the spectrum. Examples of typical segmentation are shown in Appendix A. Climb and descent segments are a function of the flaps position and gust turbulence parameters which are specified for specific altitude intervals. In the case of the structural element considered in this program (root lower surface of a straight wing), reduction in the number of climb and descent segments was found to be possible without any significant effects on crack growth. However, no generalization can be made on this point. Each spectrum must be evaluated individually to see if such simplifications are acceptable.
- 4. Conversion from exceedance data parameters into loads or stress units applicable to the type of spectrum desired. Typical exceedance data parameters are: airplane cg load factors, gust velocities, landing sink rates, runway-taxiway roughness, braking coefficients, etc. Use of these parameters in conjunction with the specific airplane configurations defined in mission profile segments in terms of gross weight, fuel, payload, speed and time or distance traveled produce unique sets of loads spectra. Transfer functions between the exceedance data general parameters and load-stress should reflect, where appropriate and significant, the dynamic response characteristics of the rigid and elastic modes of the airplane.

- 5. Generation of the loading sequence should be as realistic as possible with respect to cycle and flight-mission sequence. Based on results of this program, the following guidelines should be used in generating the loading sequence.
 - a. Make the length of the spectrum repeatable sequence approximately one-tenth of the projected service lifetime requirement. This implies that the highest loads in the spectrum are those normally encountered in that time interval. Increasing the length would increase the highest load magnitude and produce more retardation. This would tend to produce a slower crack growth rate dependent on encountering the higher loads. This could be viewed as unconservative. On the other hand, decreasing the length would tend to produce conservative crack growth estimates, unless the less frequent loads are added in after a number of the spectrum repetitions.
 - b. Unless there is a specific requirement, sequence the missions in a random manner.
 - c. Sequence the segments within a flight in a natural sequence.
 - d. Choose the sequence of cycles within a segment in a random manner.
 - e. Use the random valley/peak coupling.
 - f. Use of the above guidelines will produce a random cycle-by-cycle, flight-by-flight spectrum. In any simplificiation of such spectrum, if desired for cost effectiveness in testing or analysis, should retain the 25 highest peaks as they were, average other loading cycles into a fewer number of different loadings while retaining the same number of cycles, average transition cycles of large periodic mean load changes (such as GAG cycle) separately from other loading cycles, retain flight-by-flight format and use a lo-hi-lo sequence of cycles within a flight. Distribute the 25 highest peaks in the spectrum at equal intervals.
 - g. Use $\Delta g = 0.10$ as the averaging interval in the incremental load factor exceedance spectra usage.
 - h. In order to eliminate cycles which do not contribute to crack growth, exclude cycles with ranges less than 2250 psi, tension-tension, and tension-compression cycles. The optimum truncation level is a function of spectrum type, material, structural detail and crack length. The value quoted here is considered to be applicable to aluminum alloys of 2000 and 7000 series.
 - i. Compression loadings. Retain all compression valleys (do not clip) in compression-tension cycles. Compression-compression cycles appear to increase crack growth rate. Range truncation level was not established for these types of cycles.



REFERENCES

- 1. Abelkis, P. R., et al: "A User's Manual for a Computer Program to Generate Fatigue Spectrum Loading Sequences," AFFDL-TR-78-136, Nov. 1978.
- 2. Bowie, O. L.: "Analysis of an Infinite Plate Containing Radial Cracks Originating from the Boundary of Internal Circular Hole," Journal of Mathematics and Physics, Vol. 35, 1956.
- 3. Dill, H. D. and Saff C. R.: "Effects of Fighter Attack Spectrum on Crack Growth," AFFDL-TR-76-112, March 1977.
- 4. Willenborg, J., et al: "A Crack Growth Prediction Model Using an Effective Stress Concept," AFFDL-TM-71-1-FBR, 1971.
- 5. Gallagher, J. P. and Hughes, T. F.: "Influence of Yield Strength on Overload Affected Fatigue Crack Behavior in 4340 Steel," AFFDL-TR-74-27, March 1974.
- 6. Douglas Aircraft Co.: "C-15 Design Damage Tolerance and Durability Study," unpublished data, 1977.
- 7. Simpkins, D. et al: "Load-Time Dependent Relaxation of Residual Stresses," Journal of Aircraft, Vol. 9, No. 12, Dec. 1972.
- 8. Parker, G. S.: "Generalized Procedures for Tracking Crack Growth in Fighter Aircraft," AFFDL-TR-76-133, Jan. 1977.
- 9. Douglas Aircraft Co.: "KC-10A Damage Tolerance and Durability Assessment Program," unpublished data, 1978.
- 10. Abelkis, P. R.: "Use of Microfractography in the Study of Fatigue Crack Propagation Under Spectrum Loading," ASTM STP 645, May 1978.
- 11. Rockwell International Corporation: "B-1 Wing Outer Panel Fatigue Loads Spectrum," TFD 78-697, September 1978.
- 12. Denyer, A. G.: "Flight-by-Flight Spectrum Development," paper presented at ASTM Symposium on Service Fatigue Loads Monitoring, Simulation and Analysis, November 14-15, 1977, Atlanta, GA.
- 13. Bryan, D. F.: "The B-52G-H Wing Cyclic Test Program," AFFDL-TR-70-144, December 1969.

APPENDIX A MISSION PROFILE AND STRESS DATA

This appendix contains a detail description of the five missions used in the formulation of the loads spectra in this study. Each flight is divided into segments. A segment represents a portion of the flight, in-air or on the ground, during which the parameters which define the loads-stress spectra are constant or can be represented by an average. Pertinent information needed for the development of the spectrum is specified for each segment. This information is:

Segment description
Altitude
Average gross weight
Average speed
Time spent in segment
Distance traveled in segment
F and P constants which define the stress-load factor relationship, where
stress = F (load factor) + P
One g stress
The stress is gross area stress.

TABLE A-1
MISSION PROFILE AND STRESS DATA
MISSION 1, FLIGHT 1A – BASIC AND ALTERNATE EMPLOYMENT

| SEGMENT | ALTITUDE (FT x 10-3) | AVE GW | AVERAG (M) | AVERAGE SPEED (M) (KFAS) | TIME (HR) | DISTANCE (N MI) | F (PSI) | P (PSI) | 1.0g STRESS (PSI) |
|---------------------------------|-------------------------|---------|---------------|--------------------------|-----------|--------------------|---------|------------|----------------------|
| PREELIGHT GROUND STOL TAKEDEE | | 166 021 | | | | 1 | -8 736 | | -8 736 |
| INITIAL CLIMB FLAPS DOWN 23 DEG | 0-1 | 166.021 | 0.175 | 115 | 0.012 | 1.39 | 8.043 | 413 | 8,456 |
| CLIMB | 1-2.5 | 163,109 | 0.435 | 282 | 0.007 | 2.01 | 8,415 | -1,716 | 669'9 |
| - | 2.5-5 | - | 0.446 | 278 | 0.009 | 2.63 | - | + | • |
| | 5-10 | | 0.468 | 269 | 0.020 | 6.03 | | | |
| | 10-20 | | 0.522 | 259 | 0.049 | 16.03 | | | |
| | 20-30 | - | 0.589 | 237 | 690.0 | 24.47 | - | - | - |
| CLIMB | 30-37.7 | 163,109 | 0.652 | 216 | 0.120 | 45.40 | 8,415 | -1,716 | 669'9 |
| CRUISE | 37.7-38.1 | 158,677 | 0.686 | 205 | 0.438 | 172.40 | 8,828 | -2,021 | 6,807 |
| DESCENT | 38.1-30 | 156,213 | 0.685 | 225 | 0.044 | 17.46 | 8,927 | -1,625 | 7,302 |
| 4 | 30-20 | + | 0.621 | 250 | 0.064 | 23.92 | - | - | 4 |
| | 20-10 | | 0.503 | - | 0.069 | 21.76 | | | |
| - | 10-5 | | 0.434 | - | 0.037 | 10.36 | • | - | • |
| DESCENT | 5-3 | | 0.407 | 250 | 0.015 | 3.98 | 8,927 | -1,625 | 7,302 |
| DESCENT, FLAPS DOWN, 23 DEG | 3-1.5 | | 0.260 | 165 | 0.015 | 2.56 | 8,877 | 239 | 9,116 |
| APPROACH, FLAPS DOWN, 33 DEG | 1.5-5 | - | 0.208 | 135 | 0.011 | 1.51 | 8,877 | 322 | 9,199 |
| APPROACH, FLAPS DOWN, 45 DEG | 0.5-0 | 156,213 | 0.159 | 105 | 0.010 | 1.05 | 8,877 | -256 | 8,621 |
| LANDING, STOL | SL | 155,609 | 1 | 85 | 1 | 1 | 8,910 | -3,805 | 5,105 |
| POSTFLIGHT GROUND | SL | 155,609 | I | 1 | 1 | 1 | -6,765 | 0 | -6,765 |
| | | | TOTAL: | | 0.989 | 352.96 | | | |

TABLE A-2

MISSION PROFILE AND STRESS DATA

1.0g STRESS -7,070 10,997 10,354 10,354 10,213 10,444 10,444 12,094 12,425 8,158 5,709 (PSI) -1,089-1,873-1,873-2,228-1,840-1,840-149182 ,393 P (PSI) 12,086 12,284 070,7-12,227 12,227 12,441 12,284 12,243 12,243 6,765 F (PSI) 5,709 DISTANCE (N MI) MISSION 1, FLIGHT 1B - BASIC AND ALTERNATE EMPLOYMENT 13.26 2.07 3.32 7.47 18.90 32.00 38.92 152.22 25.04 23.02 10.92 4.51 344.27 TIME (HR) 0.017 0.024 0.033 0.007 0.057 0.089 0.101 0.384 0.067 0.073 0.039 0.017 0.030 0.040 0.989 0.011 AVERAGE SPEED (M) (KEAS) 288 263 225 218 233 250 250 241 126 165 102 TOTAL: 0.213 0.449 0.483 0.529 0.689 0.690 0.503 0.597 0.621 0.434 0.407 0.461 0.661 0.260 0.193AVE GW (LB) 190,762 187,441 90,762 182,588 179,764 179,764 187,441 178,884 178,884 ALTITUDE $(FT \times 10^{-3})$ 30-35.2 35.2-35.9 1-2.5 3-1.5 5-10 10-20 35.9-30 20-30 30-20 20-10 2.5-5 5-3 10-5 1.5-0 SL PREFLIGHT GROUND, CTOL TAKEOFF INITIAL CLIMB, FLAPS DOWN, 14 DEG APPROACH, FLAPS DOWN, 33 DEG DESCENT, FLAPS DOWN, 23 DEG POSTFLIGHT GROUND LANDING, CTOL SEGMENT DESCENT DESCENT CRUISE CLIMB CLIMB

TABLE A-3
MISSION PROFILE AND STRESS DATA
MISSION 2, FLIGHT 2 — LONG-RANGE LOGISTICS

| SEGMENT | ALTITUDE (FT x 10-3) | AVE GW (LB) | AVERAG (M) | AVERAGE SPEED TIME (M) (KEAS) (HR) | TIME (HR) | DISTANCE (N MI) | F (PSI) | P (PSI) | 1.0g STRESS (PSI) |
|-----------------------------------|-------------------------|----------------|---------------|------------------------------------|--------------|--------------------|------------|------------|----------------------|
| PREFLIGHT GROUND, CTOL TAKEOFF | SL | 231,313 | 1 | 1 | 1 | 1 | -11,534 | 0 | -11,534 |
| INITIAL CLIMB, FLAPS DOWN, 14 DEG | 0-1 | 231,313 | 0.222 | 146 | 0.019 | 2.79 | 11,690 | -1,411 | 10,279 |
| CLIMB | 1-2.5 | 227,558 | 0.467 | 302 | 800.0 | 2.46 | 11,435 | -2,096 | 9,339 |
| 4 | 2.5-5 | • | 0.475 | 296 | 0.013 | 4.04 | • | - | - |
| | 5-10 | | 0.482 | 277 | 0.030 | 9.32 | | | |
| - | 10-20 | - | 0.529 | 263 | 0.080 | 26.52 | - | - | → |
| CLIMB | 20-30.6 | 227,558 | 0.617 | 249 | 0.134 | 49.79 | 11,435 | -2,096 | 9,339 |
| CRUISE | 30.6-36.4 | 195,510 | 0.687 | 229 | 5.055 | 2,016.44 | 6,677 | -2,219 | 7,458 |
| DESCENT | 36.4-30 | 165,840 | 0.688 | 230 | 0.050 | 20.00 | 10,766 | -1,691 | 9,075 |
| • | 30-20 | - | 0.621 | 250 | 990.0 | 24.66 | + | + | - |
| | 20-10 | | 0.503 | • | 0.072 | 22.70 | | | |
| | 10-5 | | 0.434 | | 0.038 | 10.64 | | | |
| - | 5-2.5 | | 0.401 | - | 0.019 | 4.98 | - | - | - |
| DESCENT | 2.5-1.5 | | 0.392 | 250 | 0.008 | 2.06 | 10,766 | -1,691 | 9,075 |
| APPROACH, FLAPS DOWN, 23 DEG | 1.5 | - | 0.233 | 150 | 0.083 | 12.73 | 10,709 | 33 | 10,742 |
| APPROACH, FLAPS DOWN, 33 DEG | 1.5-0 | 165,840 | 0.170 | 111 | 0.050 | 5.61 | 10,709 | 289 | 10,998 |
| LANDING IMPACT, CTOL | SL | 164,950 | 1 | 102 | 1 | 1 | 7,178 | -117 | 7,061 |
| POSTFLIGHT GROUND | SL | 164,950 | - | 1 | 1 | - | -5,858 | 0 | -5,858 |
| | | | TOTAL: | | 5.725 | 2,214.74 | | | |

TABLE A-4
MISSION PROFILE AND STRESS DATA
MISSION 3, FLIGHTS 3A AND 3B — LOW ALTITUDE RESUPPLY

| SEGMENT | ALTITUDE (FT × 10 ⁻³) | AVE GW (LB) | AVERAG (M) | AVERAGE SPEED (M) (KEAS) | TIME (HR) | DISTANCE (N MI) | F (PSI) | P (PSI) | 1.0g STRESS (PSI) |
|-----------------------------------|--------------------------------------|----------------|---------------|--------------------------|--------------|--------------------|------------|------------|----------------------|
| FLIGHT 3A: | | | | | | | | | |
| PREFLIGHT GROUND, STOL TAKEOFF | SL | 166,352 | 1 | 1 | 1 | 1 | -6,394 | 0 | -6,394 |
| INITIAL CLIMB, FLAPS DOWN, 23 DEG | 0-1 | 166,352 | 0.175 | 115 | 0.012 | 1.39 | 10,354 | 429 | 10,783 |
| CRUISE, LOW LEVEL | - | 163,103 | 0.424 | 275 | 0.448 | 125.26 | 10,362 | -1,287 | 9,075 |
| APPROACH, FLAPS DOWN, 23 DEG | - | 159,738 | 0.262 | 170 | 0.011 | 1.90 | 10,280 | 141 | 10,421 |
| APPROACH, FLAPS DOWN, 33 DEG | - | 159,738 | 0.208 | 135 | 0.008 | 1,10 | 10,280 | 342 | 10,622 |
| APPROACH, FLAPS DOWN, 45 DEG | 1-0 | 159,738 | 0.160 | 105 | 0.010 | 1.06 | 10,280 | -262 | 10,018 |
| LANDING, STOL | SL | 159,230 | 1 | 82 | 1 | 1 | 6,683 | -321 | 6,362 |
| POSTFLIGHT GROUND | SL | 159,230 | 1 | 1 | I | ſ | -5,693 | 0 | -5,693 |
| | | | TOTAL: | | 0.489 | 130.71 | | | |
| FLIGHT 3B: | | | | | | | | | |
| PREFLIGHT GROUND, CTOL TAKEOFF | SL | 218,106 | 1 | 1 | 1 | 1 | -9,323 | 0 | -9,323 |
| INITIAL CLIMB, FLAPS DOWN, 14 DEG | 0-1 | 218,106 | 0.219 | 144 | 0.018 | 2.60 | 12,573 | -1,238 | 11,335 |
| CRUISE, LOW LEVEL | - | 214,512 | 0.409 | 266 | 0.432 | 116.51 | 12,928 | -1,914 | 11,014 |
| APPROACH, FLAPS DOWN, 23 DEG | - | 211,021 | 0.262 | 170 | 0.011 | 1.90 | 13,291 | -357 | 12,934 |
| APPROACH, FLAPS DOWN, 33 DEG | 1-0 | 211,021 | 0.192 | 126 | 0.028 | 3.55 | 13,291 | 26 | 13,317 |
| LANDING, CTOL | SL | 210,600 | ı | 102 | 1 | 1 | 9,776 | -1,367 | 8,409 |
| POSTFLIGHT GROUND | SL | 210,600 | 1 | 1 | ı | 1 | -7,838 | 0 | -7,838 |
| | | | TOTAL: | | 0.489 | 124.56 | | | |

TABLE A-5

MISSION PROFILE AND STRESS DATA MISSION 4, FLIGHT 4A – BASIC TRAINING

| | SEGMENT | ALTITUDE (FT x 10 ⁻³) | AVE GW (LB) | AVERAG (M) | AVERAGE SPEED (M) (KEAS) | TIME (HR) | DISTANCE (N MI) | F (PSI) | P (PSI) | 1.0g STRESS (PSI) |
|------|---------------------------------------|--------------------------------------|-------------|---------------|--------------------------|--------------|--------------------|------------------|------------------|----------------------|
| | PREFLIGHT GROUND, STOL TAKEOFF | SL | 167,630 | 1 | 1 | 1 | ı | -8,910 | 0 | -8,910 |
| | INITIAL CLIMB, FLAPS DOWN, 23 DEG | 0-1 | 167,630 | 0.175 | 115 | 0.012 | 1.39 | 7,920 | 446 | 8,366 |
| | CLIMB | 1-2.5 | 166,424 | 0.435 | 282 | 0.005 | 1.43 | 8,011 | -1,452 | 6,559 |
| | • | 2.5-5 | + | 0.446 | 278 | 0.009 | 2.63 | - | - | - |
| | | 5-10 | - | 0.468 | 269 | 0.020 | 6.03 | - | - | - |
| | CLIMB | 10-15 | 166,424 | 0.498 | 260 | 0.023 | 7.25 | 8,011 | -1,452 | 6,559 |
| | CRUISE | 15 | 164,732 | 0.522 | 259 | 0.123 | 40.23 | 8,234 | -2,063 | 6,171 |
| | DESCENT (SPIRAL), FD, 23 DEG | 15-8 | 163,482 | 0.253 | 135 | 0.078 | 12.55 | 8,333 | 64 | 8,397 |
| | DESCENT (SPIRAL), FD, 33 DEG | 8-1 | 163,482 | 0.172 | 105 | 0.078 | 8.76 | 8,333 | 315 | 8,648 |
| | APPROACH, FLAPS DOWN, 45 DEG | 1-0 | 163,482 | 0.137 | 06 | 0.017 | 1.54 | 8,333 | 289 | 8,044 |
| | LANDING, STOL, TOUCH AND GO | SL | 163,050 | 1 | 82 | 1 | 1 | 9,818 | -5,402 | 4,416 |
| | GROUND, STOL TAKEOFF | SL | 163,050 | 1 | 1 | 1 | ı | -8,044 | 0 | -8,044 |
| | INITIAL CLIMB, FLAPS DOWN, 23 DEG | 0-1 | 162,032 | 0.175 | 115 | 0.012 | 1.39 | 8,432 | 464 | 8,896 |
| 0.51 | GO-AROUND CRUISE | 1.0 | • | 0.385 | 250 | 0.059 | 14.98 | 8,440 | -1,345 | 7,095 |
| | | | | | | | | 8,698 | -1,312 | 7,386 |
| | APPROACH, FLAPS DOWN, 23 DEG | 1.0 | | 0.262 | 170 | 0.011 | 1.90 | 8,432 | 111 | 8,543 8,805 |
| ~ | APPROACH, FLAPS DOWN, 33 DEG | 1.0 | | 0.208 | 135 | 0.008 | 1.10 | 8,432 | 363 | 8,795 |
| | APPROACH, FLAPS DOWN, 45 DEG | 1-0 | | 0.160 | 105 | 0.010 | 1.06 | 8,432 | -241 -214 | 8,191 |
| | LANDING, STOL | SL | | 1 | 82 | ı | 1 | 9,776 | -5,201 -4,651 | 4,575 |
| - | GROUND, TOUCH AND GO, STOL TAKEOFF | SL | 162,032 | 1 | 1 | I | I | -7,838 -7,260 | 00 | -7,838 -7,260 |
| 1 | | | | | | | | | | |

(1) REPEATED TWICE IN A ROW. AVERAGE GW = 160,051 SECOND TIME.

- CONTINUED ON NEXT PAGE

<u>=</u>

TABLE A-5 (CONT)

MISSION PROFILE AND STRESS DATA MISSION 4, FLIGHT 4A — BASIC TRAINING

| | SECMENT | ALTITIDE | AVEGW | AVERAG | AVERAGE SPEED | TIME | DISTANCE | ц | ۵ | 1.0g STRESS |
|-----|--|-----------------------|---------|--------|---------------|-------|----------|--------|--------|-------------|
| | | $(FT \times 10^{-3})$ | (LB) | (W) | (KEAS) | (HR) | (IM N) | (PSI) | (PSI) | (PSI) |
| | INITIAL CLIMB. FLAPS DOWN, 23 DEG | 0-1 | 158.092 | 0.175 | 115 | 0.012 | 1.39 | 8,737 | 202 | 9,244 |
| No. | | | | | | | | 8,828 | 204 | 9,332 |
| | GO-ABOUND CRIUSE | 10 | | 0.385 | 250 | 0.059 | 14.98 | 8,745 | -1,361 | 7,384 |
| | | ? | | | | |) | 8,836 | -1,328 | 7,508 |
| | APPROACH, FLAPS DOWN, 23 DEG | 1.0 | | 0.262 | 170 | 0.011 | 1.90 | 8,737 | 135 | 8,872 |
| _ | | | | | | | | 8,828 | 252 | 080'6 |
| ~ | APPROACH, FLAPS DOWN, 33 DEG | 1.0 | | 0.208 | 135 | 0.008 | 1.10 | 8,737 | 356 | 6,093 |
| _ | | ! | | | | | | 8,828 | 403 | 9,231 |
| | APPROACH FLAPS DOWN, 45 DEG | 1-0 | - | 0.160 | 105 | 0.010 | 1.06 | 8,737 | 217 | 8,520 |
| | | | | | | | | 8,828 | -200 | 8,628 |
| | ANDING STOI | 7 | | ı | 85 | 1 | 1 | 9,240 | -4,278 | 4,962 |
| | |) | _ | | 9 | | | 8,910 | -3,808 | 5,102 |
| _ | CBOILIND TOLICH AND GO STOL | Ū | 158 092 | ı | 1 |) | ı | -7,013 | 0 | -7,013 |
| - | TAKEOFF | 7 | 20,001 | ĺ | | | | -6,724 | 0 | -6,724 |
| | SEC SWOOD SELVED IN THE SECOND | - | 154 242 | 0 175 | 115 | 0.012 | 1 30 | 8,902 | 493 | 9,395 |
| _ | INTERACTIONS, PEARS DOWN, 23 DEG | 5 | 7+7'+61 | 2 | 2 | 210.0 | 2 | 9,001 | 531 | 9,532 |
| - | GO.ABOLIND CRITISE | 10 | | 0.385 | 250 | 0.059 | 14.98 | 8,910 | -1,386 | 7,524 |
| _ | | 2 | | 200 | 200 | 0 | | 600'6 | -1,361 | 7,648 |
| - | APPROACH FLAPS DOWN 23 DEG | 10 | | 0.262 | 170 | 0.011 | 1 90 | 8,902 | 191 | 6,093 |
| | | 2 | | 202.0 | 2 | - | 2 | 9,001 | 229 | 9,230 |
| - | APPROACH FLAPS DOWN 33 DEG | 10 | | 0.208 | 135 | 0 008 | 1 10 | 8,902 | 442 | 9,344 |
| _ | | 2 | | | 2 | |) | 9,001 | 431 | 9,432 |
| _ | APPROACH ELAPS DOWN 45 DEG | 1-0 | | 0.160 | 105 | 0000 | 1.06 | 8,902 | -111 | 8,791 |
| - | יייי אייייי אייייייייייייייייייייייייי | 2 | | 3 | 3 | 2 | 2 | 9,001 | -173 | 8,828 |
| _ | I ANDING STOI | Ū | | | 85 | ı | ١ | 8,580 | -3,305 | 5,275 |
| | | 3 | _ | | } | | | 8,168 | -2,805 | 5,363 |
| | GROUND TOUCH AND GO STOL | ī. | 154 242 | ı | I | I | ı | -6,435 | 0 | -6,435 |
| | TAKEOFF | 1 | | | | | | -6,188 | 0 | -6,188 |
| | | | | TOTAL: | | 0.965 | 204.39 | | | |
| | | | | | | | | | | |

(1) REPEATED TWICE IN A ROW. AVERAGE GW = 156,156 SECOND TIME.
(2) REPEATED TWICE IN A ROW. AVERAGE GW = 152,353 SECOND TIME.
AFTER LAST LANDING, FULL CTOL LANDING ROLL AND TAXI.

(2)

(1)

MISSION PROFILE AND STRESS DATA MISSION 4, FLIGHT 48 – BASIC TRAINING **TABLE A-6**

| SEGMENT | ALTITUDE (FT x 10-3) | AVE GW | AVERAGE SPEED | E SPEED | TIME | DISTANCE | F (per) | P (120) | 1.0g STRESS |
|-----------------------------------|-------------------------|---------|---------------|---------|--------|------------|---------|---------|-------------|
| | | 1001 | (1111) | (NEAS) | (1111) | (1141 411) | (101) | (101) | (101) |
| PREFLIGHT GROUND, CTOL TAKEOFF | SL | 187,422 | ı | 1 | 1 | 1 | 009'9- | 0 | 009'9- |
| INITIAL CLIMB, FLAPS DOWN, 14 DEG | 0-1 | 187,422 | 0.213 | 140 | 0.017 | 2.40 | 12,202 | -978 | 11,224 |
| CLIMB | 1-2.5 | 186,470 | 0.442 | 286 | 90000 | 1.75 | 12,251 | -1,650 | 10,601 |
| CLIMB | 2.5-5 | 186.470 | 0.451 | 281 | 0.010 | 2.95 | | -1,650 | 10,609 |
| CLIMB | 5-10 | 186,470 | 0.451 | 260 | 0.021 | 6.10 | | -1,650 | 10,601 |
| CRUISE | 10 | 184,346 | 0.452 | 248 | 0.203 | 58.61 | 12,326 | -1,848 | 10,478 |
| DESCENT | 10-5 | 182,210 | 0.434 | 250 | 0.039 | 10.88 | 12,201 | -1,716 | 10,585 |
| DESCENT | 5-2.5 | 182,210 | 0.401 | 250 | 0.020 | 5.25 | 12,201 | -1,716 | 10,585 |
| DESCENT | 2.5-1.5 | 182,210 | 0.392 | 250 | 0.008 | 2.06 | 12,201 | -1,716 | 10,585 |
| APPROACH, FLAPS DOWN, 23 DEG | 1.5 | 182,210 | 0.233 | 150 | 0.083 | 12.73 | 12,293 | -48 | 12,245 |
| APPROACH, FLAPS DOWN, 33 DEG | 1.5-0 | 182,210 | 0.170 | 111 | 0.050 | 5.61 | 12,293 | 204 | 12,497 |
| LANDING, CTOL | SL | 181,565 | 1 | 102 | 1 | 1 | 7,508 | 999 | 8,173 |
| GROUND, TOUCH AND GO, CTOL | SL | 181,565 | ı | 1 | 1 | ı | -5,957 | 0 | -5,957 |
| TAKEOFF | | | | | | | | | |
| INITIAL CLIMB, FLAPS DOWN, 14 DEG | 0-1 | 180,227 | 0.213 | 140 | 0.017 | 2.40 | 12,251 | -907 | 11,344 |
| GO-AROUND CRUISE | 1.0 | | 0.385 | 250 | 0.044 | 11.17 | 12,260 | -1,353 | 10,907 |
| APPROACH, FLAPS DOWN, 23 DEG | 1.0 | | 0.262 | 170 | 0.011 | 1.90 | 12,251 | -51 | 12,200 |
| APPROACH, FLAPS DOWN, 33 DEG | 1.0 | 180,227 | 0.192 | 126 | 0.028 | 3.55 | 12,251 | 200 | 12,451 |
| LANDING, CTOL | SL | 178,890 | 1 | 102 | 1 | I | 6,724 | 1,446 | 8,170 |
| POSTFLIGHT GROUND | SL | 178,890 | ì | 1 | ı | 1 | -5,709 | 0 | -2,709 |
| | | | TOTAL: | | 0.540 | 127.36 | | | |

APPENDIX B STRESS SPECTRA SUMMARIES

This appendix contains the summaries of the 116 spectra developed in the study of spectrum variation. All stresses shown are gross area stresses. The summary for each spectrum presents the following information:

Spectrum identification (coding) and number
Spectrum description
Flight hours, flights and landings represented by the spectrum
Total cycles in the spectrum
Average number of cycles per flight and per flight hour
Range truncation level
Highest peak and lowest valley in the spectrum
Spectrum peak, range and R distributions.

TABLE B-1 SPECTRUM BSI (NO. 1)

DESCRIPTION: BASELINE SPECTRUM, MISSION I (FLIGHTS LA & LB), BASIC AND ALTERNATE EMPLOYMENT

| FLIGHT HOURS | н | 2,500 | FLIGHTS = 2,528 | - LANDINGS - | 2,528 |
|--------------------------------|----|--------|-----------------------------------|---------------------------------|---------|
| TOTAL CYCLES | н | 45,807 | AVERAGE NO. OF CYCLES PER: FLIGHT | FLIGHT = | 18.1 |
| RANGE TRUNCATION (PSI) = 4,000 | | 4,000 | | FLIGHT HOUR = 18.3 | 18.3 |
| HIGHEST PEAK (PSI) | 11 | 22,114 | SMALLES | SMALLEST VALLEY (PSI) = -24.298 | -24.298 |

SMALLEST VALLEY (PSI) = -17,878

FLIGHTS = 437

AVERAGE NO. OF CYCLES PER: FLIGHT = 23.9

FLIGHT HOUR = 4.2

FLIGHT HOURS = 2,500

TOTAL CYCLES = 10,422

RANGE TRUNCATION (PSI) = 4,000

HIGHEST PEAK (PSI) = 17,915

DESCRIPTION: BASELINE SPECTRUM, MISSION 2 (FLIGHT 2), LONG-RANGE LOGISTICS

TABLE B-2 SPECTRUM BS2 (NO. 2)

| PEAK DISTRIBUTION | RAIGE DISTRIBUTION | R DISTRIBUTION |
|-------------------|--------------------|----------------|
| ak (psi) I n | Range (psi) n | 2 |

| | MANUE DISTALDOTTON | 10110 | | |
|----------|--------------------|-------|-------|-------|
| (psi) n | Pange (psi) | u | R | C |
| | | | | • |
| -12,000 | | | -1.5 | 200 |
| 4 | | | -1.2 | 197 |
| 0 | 000 | | | 26 |
| 0,000 | 000,1 | | 0.1 | 82 |
| -3,000 | 7,000 | | 2. | 0/ |
| -8,000 | 3,000 | 0 | | 1 |
| 1 | 4,000 | , 070 | 7 | |
| 2 | 5.000 | 9/1/9 | - 9 - | 0 |
| | - 000 9 | 1,945 | - 5 | 0 |
| 0 | 000. | 454 | | 0 |
| -4,000 | 000, | 001 | 1 | 0 |
| -3,000 | 8,000 | 1441 | | 0 |
| - | 000.6 | 100 | 2 | - |
| 0 | 10.000 | 60 | | - |
| * | 11 000 | 6 | 0 | 2 |
| | 12,000 | , | - | 2 |
| 000, | 15,000 | 0 | - 0 | 74 |
| 2,000 | 13,000 | V | 7. | 87 |
| 3.000 | 14.000 | T | .3 | 177 |
| 000 7 | 15,000 | | 4 | 901 |
| 2000 | 16,000 | | 4 | 437 |
| | 2000 | | . 4 | 3,753 |
| 0,000 | 000,71 | | 0.1 | 3,578 |
| 1,000 | 18,000 | | | 19 |
| 8,000 | 000,61 | | 20. | 0 |
| - | 20,000 | 0 | 6. | 0 |
| + | 21,000 | 2 | 1.0 | 1431 |
| 11.000 | 22,000 | 4 | | 104/1 |
| - | 23 000 | 0 | | |
| | 2000 | 82 | | |
| 1,104 | 000, 42 | 0/ | | |
| - | 000,62 | 7 | | |
| - | 26,000 | 1 | | |
| <u> </u> | 27,000 | 243 | | |
| - | 28,000 | 27 | | |
| - | 29.000 | | | |
| 19,000 | 30.000 | | | |
| | 21 000 | 0 | | |
| 20,000 | 31,000 | , | | |
| 21,000 | 32,000 | 0 | | |
| 22,000 | 33,000 | | | |
| 23,000 | 34,000 | | | |
| 24.000 | 35,000 | | | |
| 25.000 | | | | |
| 27,000 | | | | |
| 200 | | | | |
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| Peak (ps1) | 1 | | | | |
|------------|----------|-------------|--------|-------|--------|
| | = | Range (psi) | u | R | U |
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| -12 600 | | | | 5 1- | 1 |
| 11,000 | | | | | 1,088 |
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| -8,000 | I | 3,000 | - | -8- | 100 |
| 000 | | 4 000 | 0 | _ 7 | 141 |
| 000 | | 000 | 160'22 | ,, | 231 |
| 0000 | 0 | 2000 | 4.489 | 0.1 | 303 |
| - | 1515 | 000,0 | 10001 | 5 | 177 |
| 1 | 1.2. | 7.000 | 10,51 | - 4 - | |
| | 6,366 | 8 000 | 4,614 | | 25 |
| 000 | 011 | 000 | 1,362 | 2 0 | 0 |
| 000, | 18 | 000.6 | 3/4 | 7:- | 47 |
| 000 | - | 10,000 | | - | 17 |
| 0 | 0 | 11.000 | 45 | 0 | - |
| 000 | - | 12,000 | 52 | 0 - | 89 |
| 000, | | 12,000 | 6 | - | 30 |
| 2,000 | T | 13,000 | 9 | .2 | 300 |
| 3 000 | 1 | 000 70 | 1 | 7 | 663 |
| 000 | → | 000 | 0 | ? • | 200 |
| 000,4 | 0 | 000.61 | 12 | 4. | 3 897 |
| 2,000 | 700 | 16,000 | - | .5 | 12 071 |
| 000.9 | | 17,000 | | 9. | 10000 |
| 000 | 0 | 18,000 | 0 | 7 | FF2,21 |
| | 212 | 000 | 79 | | 1,210 |
| - | 1,912 | 000,61 | 661 | 0. | 0 |
| 3,000 | 4.795 | 20,000 | 101 | 6. | 0 |
| - | 200 | 21,000 | 900 | 0. | 2111 |
| - | 9/0/7 | 22 000 | 013 | | (1,665 |
| | 11111 | 000 | 1,372 | | |
| _ | 6,423 | 23,000 | 694 | | |
| | 11 103 | 24,000 | 77 | | |
| - | 2011 6 | 25,000 | 1 " | | |
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| | 1,528 | 27 (00) | 0 | | |
| 000 | 112 | 000,12 | 2 | | |
| 000, | 123 | 78,000 | 0 | | |
| 000 | 90 | 29,000 | | | |
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| 0000 | 1 | 32,000 | | | |
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| 25,000 | | 1 | | | |
| 26.000- | | | | | |
| 00016 | | | | | |
| 200 | | | | | |
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TABLE B-3

SPECTRUM BS3 (NO. 3)

DESCRIPTION: BASELINE SPECTRUM, MISSION 3 (FLIGHTS 3A AND 3B), LOW-ALTITUDE RESUPPLY

649.353 4,000 FLIGHT HOURS
TOTAL CYCLES
RANGE TRUNCATION (PSI)

FLIGHTS = 5,112 LANDINGS AVERAGE NO. OF CYCLES PER: FLIGHT

LANDINGS = 5,112 FLIGHT = 127.0 FLIGHT HOUR = 259.7 ST VALLEY (PSI) = -15,692 SMALLEST VALLEY (PSI) =

DISTRIBUTION

×

RATE DISTRIBUTION

PEAK DISTRIBUTION

Peak (psi)

HIGHEST PEAK (PSI)

(psi)

Pange

FLIGHT HOURS = 2,500

TOTAL CYCLES = 199,036

RANGE TRUNCATION (PSI) = 4,000

HIGHEST PEAK (PSI) = 28,841

LANDINGS = 15.872
FLIGHT = 64.0
FLIGHT HOUR = 79.6
ST VALLEY (PSI) = -27.983 SMALLEST VALLEY (PSI) = FLIGHTS = 3,111 LANDINGS AVERAGE NO. OF CYCLES PER: FLIGHT

DISTRIBUTION

×

DESCRIPTION: BASELINE SPECTRUM, MISSION 4 (FLIGHTS 4A AND 4B), BASIC TRAINING

SPECTRUM BS4 (NO. 4)

FLIGHTS = 3,111

DISTRIBUTION (psi) RAIGE ande,

2,000 2, PEAK DISTRIBUTION Peak (psi) -12,000 -11,000 -10,000 -9,000 -8,000 -7,000 -6,000 -3,000 -1,000 -1,000

2, 176 4, 164 2, 176 4, 165 4, 167 2, 176 4, 167 4, 167 6, 173 4, 167 6, 173 6,

| 15,272 | 2,340 | 2,340 | 6,3 | 6,3 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 | 6,0 2,000 2,000 4,000 4,000 6,000 11,

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19,190 19,687 19,684 19

TABLE B-5 SPECTRUM BS5 (NO. 5)

AVERAGE NO. OF CYCLES PER: FLIGHT = 61.5
FLIGHT HOUR = 78.9
SMALLEST VALLEY (PSI) = -14.897 DESCRIPTION: BASELINE SPECTRUM, MISSION 5 (FLIGHT 5), COMBAT TRAINING FLIGHT HOURS = 2,500

TOTAL CYCLES = 197,169

RANGE TRUNCATION (PSI) = 4,000

HIGHEST PEAK (PSI) = 20,664

AVERAGE NO. OF CYCLES PER: FLIGHT = 75.0
FLIGHT HOUR = 75.7
SMALLEST VALLEY (PSI) = -24.298

= 2,500 TOTAL CYCLES = 181,644 RANGE TRUNCATION (PSI) = 4,000 HIGHEST PEAK (PSI) = 23,923

DESCRIPTION: BASELINE SPECTRUM, COMPOSITE OF MISSIONS I THROUGH 5

TABLE B-6 SPECTRUM BS6 (NO. 6)

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| DISTRIBUTION | С | 117 | 0 0 | 557 | 867 | 790 | 459 | 333 | 197 | 26 | 4 | 9 9 | 44 | 69 | 19 | 611 | 243 | 101 | 200 | 3/32 | 16,125 | 52,775 | 8973/ | 639 | 0 | 0 | 19 1911 | | | | | | | | | | | | | | | | | | _ | | |
|--------------------|-------------|---------|---------|---------|-------|--------|-------|--------|--------|--------|--------|--------|--------|--------|-----|--------|--------|--------|--------|--------|--------|--------|-------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|--------|--------|--------|--------|--------|--------|--------|
| R DIST | R | | -1.2 | -1.0 | 0 | 0.0 | 0 1 | 1:- | 9 | 5 | 4 | 3 | - 2 | | | 0 - | | .2 | .3 | 4 | | | 0. | 1. | 8. | 6. | 1.0 | | | | | | | | | | | | | | | | | | | | |
| UTION | u | | | | | | 0 | 8567L | 66 142 | 24.930 | 7 840 | 1001 | 2,346 | 1,048 | 273 | 26 | 53 | 250 | 2 | 4/ | 3 | 11 | 31 | 85 | 117 | 435 | 1 113 | 2111 | 111 | 427 | 111 | 367 | 22 | 167 | 77 | - | | | 0 | | | | | | | | |
| RAWGE DISTRIBUTION | Range (psi) | | | 1.000 | 2 000 | 2000 | 2,000 | 4,000 | 2,000 | 0000,9 | 7,000 | 8,000 | 000 6 | 000 01 | 000 | 000,11 | 12,000 | 13,000 | 14.000 | 15,000 | 000 | 000.01 | 000. | 18,000 | 19,000 | 20,000 | 21,000 | 22,000 | 23,000 | 24 000 | 35,000 | 000,62 | 000,02 | 77,000 | 28,000 | 29,000 | 30,000 | 31,000 | 32 000 | 2000 | 33,000 | 34,000 | 35,000 | | | | |
| UTION | C | 2 1 | 1 | 2 6 | 1 | 0 | 201 | 2/6 | 1.373 | 3084 | 1000 | 1,020 | /36 | 24 | 2 | 0 | 0 | 0 | | 0 | 384 | 358 | 95 | 246 | 4.197 | 17.220 | 30. 300 | 24,544 | 31,803 | 36,061 | 9,0% | 26,378 | 6,028 | 1,565 | 184 | 161 | 27 | 2 | 9/ | 4 | 9 | , | | | | | |
| PEAK DISTRIBUTION | Peak (psi) | -12,000 | -11,000 | -10.000 | -000 | 000,62 | 2,000 | 000.1- | -6,000 | -2,000 | -4,000 | -3,000 | -2.000 | 1 000 | 000 | 000 | 000.1 | 2,000 | 3.000 | 4.000 | 000 | 000.5 | 00000 | 7,000 | 8,000 | 0000.6 | 10,000 | 11,000 | 12,000 | 13 000 | 000,00 | 14,000 | 000,61 | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 21 000 | 0000 | 22,000 | 73,000 | 24,000 | 25,000 | 26,000 | 27,000 | 2-21.7 |

| | 1 | PEAK DISTRIBUTION | 01100 | RAGGE DISTRIBUTION | 01104 | N DISI | 10110011101 |
|---|---|-------------------|----------|--------------------|---------|--------|-------------|
| 1000 1 1000 1 1000 1 1000 1 1 | 1 | | п | | C | W. | C |
| 1,000 1,00 | 1,000 1,00 | | | | | ! | 1932 |
| 1,000 1,00 | 1,000 1,00 | .000, | | | | -1.5 | 717 |
| 1000 127 | 1,000 1,57 1,00 | 000 | 1 | | | -1.2- | 6/5 |
| 2,000 3,000 4,000 1, | 2,000 2, | -000 | 3 | 1.000 | | 0.1- | 2.5 |
| 100 | 100 | 000 | 44 | 2,000 | | - 6 | 3 |
| 1000 1720 1.5 1. | 1 | 000 | 0 | 3 000 | | 8 | 2 |
| 1000 | 1000 | 000 | , | 000.5 | 0 | | 1 |
| 1,000 1,00 | 1 | 0000 | 200 | 4,000 | 157.762 | 1 | 2 |
| 1,000 00,145 0.00 0.0,145 0.0,145 | 1, 000 1 | 0000 | 000 | 2,000 | 22 247 | 9 | 0 |
| 7,000 00, | 1000 | 000 | 101/4 | 000.9 | 20,000 | 5 | |
| 3 1000 100 | 1, 000 1 | 000 | 260 | 7 000 | 10,146 | - 4 | 7 |
| 1000 | 1000, 65 | 000 | /3 | 0000 | 0261 | | 3 |
| 1,000 43 1,000 | 1000 | 000, | 0 | 000.0 | 625 | | • |
| 0000 1000 | 10,000 1 1 1 1 1 1 1 1 1 | 0000 | - | 9,000 | 200 | 7 | 17 |
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| 12.000 12 | 12,000 5 13,000 6 13,000 6 13,000 6 15, | 0 | - | 11,000 | | 0 | 101 |
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| 1,000 1,00 | 1,000,00 1,000 1 | 000 | | 33,000 | S | 2 | 141 |
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| 15,000 16,000 17,263 17,000 18,000 18,000 18,000 19,000 | 1000 | 3,000 | Į, | 14,000 | 2 | 5. | 12845 |
| 1000 17 17 17 17 17 17 1 | 10,000 1 | 000 | - | 15,000 | | 4. | 760 07 |
| 1,000 173 174 175 17 | 17,000 173 17,000 173 17,000 173 18,000 17,000 18,000 17,000 1 | 000 | 0 | 16.000 | 2 | .5 | 2000 |
| 1000 143 173 | 1, | 000 | 53 | 000 21 | 0 | 9 | |
| 18,000 1 | 130,756 | | 32 | 000,71 | (73 | 2,1 | 949 |
| 19,000 36, 10 10 10 10 10 10 10 10 10 10 10 10 10 | 130,000 130,788 130,788 130,000 127,200 130,000 127,200 130,000 141,200 152,000 152,000 17,000 18,000 19, | | 1.667 | 18,000 | 665 | | 0 |
| 130,000 17,000 | 00,000 1,20,788 1,20,000 1,275 1,275 1,000 1, | | 21.743 | 000,61 | 36 | 0. | 0 |
| 1000 175 25 100 175 25 | 000, 85 000, 85 000, 85 000, 85 000, 85 000, 85 1, 000, 85 1, 000, 85 1, 000, 85 1, 000, 85 1, 000, 85 2, 2, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, | - | 130 98 B | 20,000 | 117 | 6. | 0 |
| 7, 000, 22, 000, 45, 24, 000, 25, 000, 25, 000, 27, 000, | 000, 25 1,2,73 1,2,7 | 1 | 1000 | 21,000 | 300 | 1.0 | |
| 1,1350 1,1350 1,177 | 1,350 1,277 1,277 1,25,000 1,477 1,000 | 900 | 18,611 | 22,000 | 114.00 | | |
| 7 273 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 | 7, 275 7, 000, 25 1, 17 1, 18 1, | 000 | 4,300 | 2000 | 424 | | |
| 000, 85 000, 85 000 | 000, 85 000, 85 000 | 000, | 1,275 | 23,000 | /52 | | |
| 25,000 26,000 26,000 26,000 27,000 28,000 29,000 31,000 31,000 32,000 34,000 34,000 35,000 36,000 37,000 37,000 38,000 | 000'88 | 3,000 | LIN | 24,000 | " | | |
| 25,000 27,000 28,000 31,000 31,000 33,000 34,000 35,000 35,000 | 000, 25 000, 2 | 0000 | 101 | 25,000 | | | |
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| | | 000,7 | | 200,000 | | | |
| | | 3,000 | | 34,000 | | | |
| | | 4.000 | | 35,000 | | | |
| 7,000 | 6,000 | 000 | | | | | |
| 000/1 | 200, | 000 | | | | | |
| | | 200,1 | | | | | |
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TABLE B-7 SPECTRUM BS1.MMIA (NO. 7)

DE

| DESCRIPTION: MISSION I, FLIGHT IA | - | LIGHTIA | | | | |
|-----------------------------------|----|---------|----------------------------|--------------------------------|-----|---------|
| FLIGHT HOURS | ** | 2,500 | FLIGHTS = 2,528 | LANDINGS | H | 2,528 |
| TOTAL CYCLES | 11 | 49,544 | AVERAGE NO. OF CYCLES PER: | FLIGHT | H | 9.61 |
| RANGE TRUNCATION (PSI) = | - | 4,000 | | FLIGHT HOUR = | 11 | 8'61 |
| HIGHEST PEAK (PSI) | 11 | 18,461 | SMALLEST | MALLEST VALLEY (PSI) = -24,298 | = (| -24,298 |

AVERAGE NO. OF CYCLES PER: FLIGHT = 16.4

FLIGHT HOUR = 16.6

SMALLEST VALLEY (PSI) = -10,959

TABLE B-8 SPECTRUM BS1.MM1B (NO. 8)

DESCRIPTION: MISSION 1, FLIGHT 1B

| R DISTRIBUTION | R | 77/ | 6 | -1.2 | - | 0/ | 0 | | 58 | 0 | 76 | 6// | 0 | 701 | 7 | / | | .2 463 | | | .5 /5/306 | 594 | | 0 | 0 | 25,752 | | | | | | | | | | | | | | | |
|--------------------|-------------|-----|---------|---------|---------|-------|-------|------|--------|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| TION | u | | | - | | | | 0 | /5,378 | 6,167 | 13,542 | 8,400 | 2,637 | 577 | 88 | 78 | S | 33 | 0 | 82 | (5 | 0 | " | 0 | " | 181 | 1,627 | 516 | 22/ | (3 | - | 4 | 0 | • | 0 | | | | | T | |
| RAIGE DISTRIBUTION | Range (psi) | | | | 1.000 | 2.000 | 3 000 | 000 | 000.4 | 000.6 | 000,000 | 000, | 000,00 | 000,6 | 000,01 | 12,000 | 12,000 | 000,61 | 14,000 | 000,61 | 12,000 | 000.71 | 000,81 | 000,60 | 000,02 | 000,12 | 22,000 | 24,000 | 000,47 | 000,62 | 000,02 | 000,72 | 28,000 | 000,62 | 30,000 | 31,000 | 32,000 | 33,000 | 34,000 | 35,000 | 1 |
| UTION | - | T | | | | | | | | 0 | 8,579 | 13,890 | 544 | 38 | , | 0 | 0 | 0 | 0 | 0 | 07/1 | 0 | 417 | 4,424 | 186'01 | 5,917 | 2,517 | 874 | 37/ | 65 | 17 | 7 | - | , | 0 | | | | I | T | |
| PEAK DISTRIBUTION | Peak (psi) | | -12,000 | -11,000 | -10.000 | -0.00 | 0000 | 2000 | 000'/- | 000 | 000,6- | 000 | 2,000 | 000,2- | 000'- | 000 | 000, | 2,000 | 3,000 | 000, | 000.6 | 2,000 | 000, | 8,000 | 000,60 | 000,01 | 000,00 | 12,000 | 3,000 | 000,41 | 000,61 | 000,91 | 000,71 | 000,81 | 000,81 | 20,000 | 21,000 | 22,000 | 23,000 | 24,000 | 25,000 |

| | 1,000 1,00 | PEAK DISTRIBUTION | BUTION | RAGE DISTRIBUTION | SUTION | R DIST | DISTRIBUTION |
|--|--|-------------------|---------|-------------------|--------|--------|--------------|
| 1,000 2,000 3,000 3,000 2,000 3,000 | 1,000 2, | | С | | c | R | c |
| 1,000 | 1,000 | | | | I | | |
| 1,000 2 5072 - 1.0 | 1,000 2, | -12,000 | | | | | - |
| 1,000 2,000 3,000 3,000 2,446 4,000 2,672 5,000 2,672 5,000 4,000 7,656 -1,000 7,656 -1,000 7,24 -1,000 7,00 | 1,000 2,000 3,000 2,000 3,000 | -11,000 | | | - | -1.2 | |
| 2,000 2,446 3,000 2,446 6,000 2,446 6,000 6,000 7,626 1,000 1,626 1,000 1,626 1,000 1,626 1,000 1,626 1,000 1,626 1,000 1, | 2,000 3,000 6, | -10,000 | | 1.000 | | -0.1- | 3 |
| 2, 444 3,000 4,000 6,000 7,000 7,000 1 | 2, 4446 3,000 2, 4446 4,000 2, 600 2, 600 1,0 | -000 | | 2 000 | | | 5 |
| 1000 26, We 2, 000 2, | 1000 | 000 | | 3 000 | | | 174 |
| 2, 444 6 | 1000 2,672 1,500 2,672 1,500 2,672 1,500 2,672 1,500 2,672 1,500 2,672 1,500 2,672 1,500 2,672 1,500 2,672 1,500 2,672 1,500 2,672 1,500 2,672 1,500 2,672 1,500 2,572 | 2,000 | | 000 | 0 | 0. | 1,391 |
| 1,000 1,00 | 1000 | 000. | | 4,000 | 26 146 | 1 | 374 |
| 1,000 1,656 1,000 1,656 1,000 1,656 1,000 1,656 1,000 1,00 | 1,000 1,400 1,50 | 000.0- | 0 | 2,000 | 2 872 | 0 | 565 |
| 1,000 1,430 1,13 | 1,000 1,430 1,13 | -2,000 | 2 1118 | 000,9 | 1002 | 5 | 6/ |
| 1000 1/2 | 8,000 | -4,000 | 1100 | 7,000 | 000 | 4 | 1 |
| 1000 1/24 1/25 | 1000 13 15 15 15 15 15 15 15 | -3.000 | 47C | 8.000 | 009/ | - 3 | 0 |
| 1,000 1,00 | 1,000 12,000 13 | 2 000 | 00 | 0000 | 430 | | 0 |
| 1,000 1,00 | 1,000 1,00 | 1,000 | 0 | 000 | 42/ | 7. | ' |
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| 19,000 263 3,000 | 19,000 263 3,000 | 7,000 | | 18,000 | 32 | 1. | 1,007 |
| 20,000 | 20,000 | 8,000 | | 19,000 | 202 | 8. | 0 |
| 1.0 3.45 1.0 3.45 1.0 3.45 3.000 3.45 3.400 3.45 3.000 3.000 3 | 1.00 3.45 1.00 3.45 1.00 3.45 1.00 3.45 1.00 3.45 1.00 3.45 1.00 3.45 1.00 3.45 1.00 3.45 1.00 3.45 1.00 3.45 3.400 3. | 9.000 | 9 | 20.000 | 200 | 6 | 1 |
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| 25,000 2,534 2,000 2,534 2,000 3,000 2,534 3,000 3 | 25,000 2,534 2,534 2,000 2,534 2,000 3,000 2,534 3,000 3 | 13,000 | 100 300 | 24,000 | 1/2 | | |
| 25,000 2,7762 2,7762 2,000 2,000 2,000 2,000 2,000 2,000 3,000 2,000 3,000 2,000 3,000 | 000, 25 000, 25 000 | 14,000 | 1000 | 25,000 | 1,1 | | |
| 2,534 2,534 2,534 2,000 2,534 3,000 3, | 2.534 2.600 2. | 15.000 | 2,760 | 26.000 | | | |
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| 2,5 2,5 0,000 4,6 30,000 1,00 32,000 2,000 2,000 3,000 2,000 3,00 | 2/5 2/5 29,000 | 2000 | 37/ | 000,73 | 6 | | |
| 23,000 23,000 31,000 2 33,000 2 34,000 35,000 | 3,000 3, | 000,71 | 2/5 | 28,000 | , | | |
| 30,000 31,000 32,000 32,000 32,000 33,000 34,000 35,000 | 000 000 000 000 000 000 000 000 000 00 | 18,000 | 44 | 29,000 | | | |
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| 27,000 | 2,000 | 000'97 | | | | | |
| | | 27,000 | | | | | |
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TABLE B-9 SPECTRUM BS3.MM3A (NO. 9)

DESCRIPTION: MISSION 3, FLIGHT 3A

FLIGHT HOURS = 2,500

TOTAL CYCLES = 979,124

RANGE TRUNCATION (PSI) = 4,000

HIGHEST PEAK (PSI) = 23,064

AVERAGE NO. OF CYCLES PER: FLIGHT = 191.5
FLIGHT HOUR = 391.6
SMALLEST VALLEY (PSI) = -15.692

TABLE B-10 SPECTRUM BS3.MM3B (NO. 10)

DESCRIPTION: MISSION 3, FLIGHT 3B

FLIGHT HOURS = 2,500

TOTAL CYCLES = 451.627

RANGE TRUNCATION (PSI) = 4,000
HIGHEST PEAK (PSI) = 24,588

FLIGHTS - 5,112 LANDINGS - 5,112

AVERAGE NO. OF CYCLES PER: FLIGHT - 88.4

FLIGHT HOUR - 180.7

SMALLEST VALLEY (FSI) - -15,383

R DISTRIBUTION RANGE DISTRIBUTION PEAK DISTRIBUTION

267 3,038 551 1,052

| 1,000 | 1,000 3,024 2,000 3,024 3,000 3,00 | 1,000 1,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,000 3,724 3,724 3,000 3,724 3,724 3,000 3,724 3,724 3,000 3,724 3,724 3,000 3,724 3,724 3,000 3,724 3,724 3,000 3,724 3,724 3,724 3,000 3,724 3,72 | Peak (psi) | c | Range (psi) | c |
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| 17,000 46 18,000 18,00 | 17,000 46 18,000 18,00 | 17,000 18,000 18,000 21,000 22,000 24,000 25,000 26,000 27,000 27,000 28,000 2 | 5 000 | - | 16,000 | 4 |
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| C C C C C C C C C C | C C C C C C C C C C | C C C C C C C C C C | 000 | 4 | 000 00 | 0 |
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| 782,000 786,247 74,365 79,000 79,4209 39,741 28,000 28,000 7,402 7,402 7,402 7,402 7,402 7,402 7,000 7,402 7,000 | 182 22,000 24,0 | (86,247 23,000 3 | 10.099 | 1 | 21,000 | |
| 1886,247 23,000 46,357 23,000 | 1885 247 24 000 3 3 3 3 3 3 3 3 3 | 7.82 25,000 4,82 25,000 3,000 | 11 000 | 0 | 22 000 | 0 |
| 166,247 23,000 34,267 24,000 34,4264 26,000 34,4264 27,000 34,402 27,000 2,265 29,000 2,265 29,000 2,265 29,000 2,265 29,000 2,265 29,000 2,265 29,000 2,265 29,000 2,265 29,000 2,265 29,000 2,265 29,000 2,265 2,2000 2,265 2,2000 2,265 2,2000 2,265 2,2000 2,265 2,2000 2,265 2,2000 2,265 2,2000 2,265 2,2000 2,265 2,2000 2,265 2,2000 | 166,247 23,000 24,000 34,269 26,000 34,740 27,000 34,740 27,000 27,000 27,000 27,000 27,000 27,000 28,200 | 186,247 23,000 3 | 000,1 | 787 | 000,22 | 983 |
| 1,000 1,00 | 188,247 24,000 3, | 188,247 24,000 3 | 12.000 | 1 | 23.000 | - |
| 4,355 24,000 34,4229 25,000 34,742 28,000 460 29,000 7,492 28,000 460 29,000 7,492 28,000 6,000 7,800 31,000 7,800 33,000 8,800 33,000 1,800 34,000 1,800 34,000 1,800 34,000 | 4,355 24,000 34,4209 25,000 34,742 28,000 4,60 29,000 6,60 29,000 7,402 28,000 6,60 30,000 7,60 31,000 7,80 31,000 | ## 355 5',000 3' | 13 000 | 188,247 | 000 | 282 |
| 1944,269 25,000 3,1 39,744 27,000 3,4 466 29,000 466 466 29,000 2,6 466 29,000 3,1 58 31,000 3,1 68 34,000 3,1 7 35,000 1,1 8 34,000 1,1 9 35,000 1,1 1 1 1,1 1 1 1,1 1 | 1944_267 25,000 3, | 1944,269 25,000 3, | 13,000 | 4 355 | 000.42 | 9 |
| 194/204 26,000 3/4 26,000 3/4 27,000 3/4 27,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 3/4,000 2, | 194/204 26,000 3/4 2740 2740 2740 2740 2750 29,000 2.672 30,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 2.672 31,000 3.6 | 194/209 26,000 3/4 27,402 27,000 3/4 27,000 2, | 14,000 | 201 | 25.000 | |
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| 27,000 460 28,000 28,000 282 30,000 282 31,000 78 78 79 79 70 70 70 70 70 70 70 70 70 70 | 27,000 460 460 28,000 7,272 29,000 282 30,000 282 31,000 78 94,000 78 17 18 19 19 19 19 19 19 19 19 19 19 | 27,000 460 28,000 1,272 28,000 282 31,000 58 78 13,000 18 19 19 19 19 19 19 19 19 19 19 | 000,61 | 30 701 | 76,000 | 148 |
| 7,402 466 28,000 1,272 30,000 56 33,000 78 34,000 78 34,000 78 34,000 | 7,402 466 1,275 28,000 28,000 58,000 7,800 7 | 7492 7402 7402 7402 7500 | 16 000 | 141/12 | 27 000 | 04/ |
| 28,000 1,272 29,000 282 31,000 58 33,000 78 34,000 59 34,000 | 78,000 78,000 78,000 78,000 78,000 78,000 78,000 78,000 78,000 78,000 78,000 78,000 | 28,000 1,272 3,000 282 3,000 33,000 1,8 34,000 5 35,000 | 0000 | 9,402 | 200,17 | 547 |
| 29,000 282 30,000 58 31,000 78 34,000 7 15,000 | 29,000 2872 30,000 5873 31,000 7873 31,000 7873 | 29,000 282 282 30,000 58 31,000 33,000 18 34,000 1 5,000 1 1 | 1,000 | 1 | 28,000 | 10 |
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| 80 N | 78 | 8/8/5 | 000 | 2 | 000 | |
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| 24,000 | 24,000 | 24,000 | 25.000 | - | | |
| 000,00 | 27,000 | 27,000 | 2000 | | | |
| 00010 | 27,000 | 27,000 | 2000 | | | |
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| RAGGE DISTRIBUTION Pange (psi) n |
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TABLE B-11 SPECTRUM BS4.MM4A (NO. 11)

DESCRIPTION: MISSION 4, FLIGHT 4A

| FLIGHT HOURS | | 2,500 | FLIGHTS = 2,591 | LANDINGS | н |
|------------------------|----|---------|--|---------------|----|
| TOTAL CYCLES = 187,935 | | 187,935 | 35 AVERAGE NO. OF CYCLES PER: FLIGHT = | FLIGHT | |
| RANGE TRUNCATION (PSI) | H | 4,000 | | FLIGHT HOUR | 11 |
| HIGHEST PEAK (PSI) | 11 | 21.564 | SMALLES | T VALLEY (PSI | - |

= 2.500 = 239,057 = 4,000 = 32,529

DESCRIPTION: MISSION 4, FLIGHT 4B

TABLE B-12 SPECTRUM BS4.MM4B (NO. 12)

| H | 11 | 1 | н |
|-----------------|----------------------------|------------------------|---------------------------------|
| FLIGHT HOURS | TOTAL CYCLES | BANGE TRUNCATION (PSI) | HIGHEST PEAK (PSI) |
| 18,137 | 72.5 | 75.2 | -27,983 |
| н | | 11 | = (|
| LANDINGS | FLIGHT | FLIGHT HOUR | T VALLEY (PSI |
| FLIGHTS = 2,591 | AVERAGE NO. OF CYCLES PER: | | SMALLEST VALLEY (PSI) = -27,983 |
| 2,500 | 187,935 | 4,000 | 21,564 |
| | | н | 11 |
| LIGHT HOURS | AL CYCLES | RANGE TRUNCATION (PSI) | HEST PEAK (PSI) |

| | STRIBUTION RAI | VIGE DISTRIBUTION | R DISTRIBU | TIGH |
|--|----------------|-------------------|------------|------|
|--|----------------|-------------------|------------|------|

| PEAK DISTRIBUTION | RIBUTION | RAGGE DISTRIBUTION | UTION | R DISTR | DISTRIBUTION |
|-------------------|----------|--------------------|---------|---------|--------------|
| Peak (psi) | U | Pange (psi) | u | R | c |
| | | | | | |
| -12 000 | | | | 5 1 | |
| 000 | | | | | |
| 000 01 | | 1 000 | | | 0 |
| 000,01- | | 000,1 | | 0.1 | - |
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| -8,000 | | 3,000 | 0 | 8 | 200 |
| -000,7- | | 4,000 | | 7 | 200 |
| -0000-9- | - | 5.000- | 045,091 | 9 | 2,562 |
| 5 000 | 0 | 000 9 | 8,267 | 4 | 1,965 |
| 000.5 | 4.399 | 000,0 | 14.061 | | 1.607 |
| -4,000 | 2.754 | 000,7 | 11 352 | 4 | 92 |
| -3,000 | 29 | 8,000 | 2 200 | 3 | |
| -2,000- | 7 | 000,6 | 3,67 | 2 | 3 |
| -1.000 | - | 10.000 | 982 | - | 0 |
| 000 | 0 | 11 000 | 141 | | 42 |
| 000 | * | 000 | 403 | 0 - | 99 |
| - 000.1 | | 15,000 | 267 | | 80 |
| 2,000 - | - | 13,000 | 123 | .2 | 210 |
| 3,000 | - | 14,000 | 25 | .3 | 200 |
| - 000 P | - | 15,000 | 25 | A | 434 |
| 200 | | 000 | 25 | • | 2,294 |
| 000,6 | | 16,000 | 7 | C. | 16 64 |
| - 000,9 | 1 | 17,000 | - 60 | 9. | |
| 7,000 | - | 18,000 | 33 | 7 | 9/000/ |
| 000 | 0 | 000 | 9 | | 5,14 |
| 000,00 | 30 | 000,61 | 1,627 | 0.0 | 0 |
| 7,000 | 0 | 20,000 | 547 | 6. | 0 |
| - 000,01 | 9 | 21,000 | 1, 1,00 | 1.0 | 7/87 |
| 11.000 | 0 0 | 22.000 | 7,463 | | 0,11 |
| 12 000 | 64 | 23 000 | 40/1 | - | - |
| 12,000 | 55,744 | 000.00 | 1,166 | | |
| 13,000 | 106,120 | 000,42 | 181 | | |
| 14,000 - | 32.068 | 75,000 | 24 | | |
| 15,000 - | 20112 | 20,000 | 23 | | |
| 16,000 – | 11.023 | 27,000 | | | |
| 17.000- | 2000 | 28.000 | 0 | | |
| 18,000 | 2,755 | 29,000 | | | |
| 10 000 | 1,170 | 30 000 | , | | |
| 000 | 8/3 | 000 | 0 | | |
| 000,02 | HIM | 31,000 | | | |
| -000,12 | 67/ | 32,000 | | | |
| - 22,000- | 100 | 33,000 | | | |
| 23,000 | 21, | 34.000 | | | |
| 24 000 - | 14 | 35 000 | | | |
| 000,12 | 33 | 000,00 | | | |
| 000,62 | 33 | | | | |
| 26,000 | 6) | | | | |
| 27,000 | 50 | | | | |
| 32,000 - | - | | | | |
| 33,000 | - | | | | |
| | 0 | | | | |
| | | | | | |

| DISTRIBUTION | u | 1,045 | 2,882 | 2,044 | 4,510 | 3.079 | 1, 536 | 1 942 | 1 022 | 373 | 1000 | 100 | 7/7 | 828 | 454 | 1.166 | 016 | 3.967 | 32,624 | 62.782 | 5,042 | . 87 | 0 | 0 | 110'15 | | | | | | | | | | | | | | | | | |
|--------------------|-------------|-----------|---------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| R DISTR | R | -1.5 | -12 | | 0.0 | 7. | 8 | 1 | 9:- | 5 | 4 | 3 | 2 | - | 0, | | 7. | .3 | 4. | 6. | o.r | | 0.0 | 7. | 0:- | | | | | | | | | | | | | | | | | |
| UTION | u | | 1 | | | | 0 | 69 700 | 3/7/17 | 20 252 | 12 401 | 13 883 | 1/53 | 621 | /34 | 289 | 101 | /3/ | 7.0 | /3/ | 1,124 | 1,121 | 724 | 3,058 | 6,114 | 3,872 | 1,789 | 8/8 | 02/ | 47 | 5 | 8/ | 6 | 12 | • | 12 | 0 | | | | | |
| RAIGE DISTRIBUTION | Range (psi) | | | 1 000 | 2000 | 000,5 | 3,000 | 4,000 | 2,000 | 0000,9 | 7,000 | 8,000 | 000.6 | 10,000 | 000,11 | 000,21 | 13,000 | 14,000 | 000,61 | 12,000 | 000,01 | 000,01 | 000,60 | 000,02 | 22,000 | 23,000 | 24,000 | 25,000 | 26 000 | 22 000 | 28,000 | 20,000 | 30,000 | 30,000 | 20,000 | 32,000 | 33,000 | 34,000 | 35,000 | | | |
| SUTION | U | | | | | 0 | 254 | 777 | 0 | 22 798 | 30 502 | 1782 | 122 | 6 | 0 | 0 | 0 | 0 | 4,680 | 2,836 | 0 | 339 | 9,795 | 44,048 | 40,362 | 20,156 | 5,884 | 1/8/1 | 609 | 2/8 | 06 | 53 | 25 | 74 | 2 | 2 | 0 | | | | | |
| PEAK DISTRIBUTION | Peak (psi) | -12.000 | -11 000 | 1000 | 000 | 200,6- | -8,000 | 000'/- | -6,000 | -2,000 | -4,000 | -3,000 | -2,000 | -1,000 | 000. | 000, | 2,000 | 3,000 | 4,000 | 000,0 | 2,000 | 000,0 | 0000 | 000,61 | 10,000 | 12,000 | 13,000 | 14.000 | 15,000 | 16,000 | 17 (00) | 1000 | 10,000 | 20,000 | 20,000 | 000,12 | 000,22 | 20,000 | 24,000 | 000,62 | 27,000 | |

TABLE B-13 SPECTRUM BS45.MM7 (NO. 13)

DESCRIPTION: TRAINING, MISSIONS 4 AND 5

| FLIGHT HOURS | | 2,500 | 2,500 FLIGHTS = 3,152 LANDINGS = 10,118 | LANDINGS | 10,118 |
|--------------------------|---|---------|---|--------------------------------|--------|
| TOTAL CYCLES | | 198,239 | AVERAGE NO. OF CYCLES PER: | FLIGHT - | 67.9 |
| RANGE TRUNCATION (PSI) = | | 4,000 | | FLIGHT HOUR = | 79.3 |
| HIGHEST PEAK (PSI) | н | 27,611 | SMALLES | SMALLEST VALLEY (PSI) = -27.98 | -27.98 |

FLIGHTS = 6.095 LANDINGS = 25.000

AVERAGE NO. OF CYCLES PER: FLIGHT = 40.7

FLIGHT HOUR = 99.3

SMALLEST VALLEY (FSI) = -27.686

ELIGHT HOURS = 2.500
TOTAL CYCLES = 248.187
RANGE TRUNCATION (PSI) = 4.000
HIGHEST PEAK (PSI) = 27.765

TABLE B-14 SPECTRUM BS4.MM8 (NO. 14)

DESCRIPTION: TOUCH AND GO LANDINGS, MISSION 4

| | 5 | |
|-----------------------|-------------------------|--|
| | -27,983 | |
| | SMALLEST VALLEY (PSI) = | |
| 2001 | 27,611 | |
| | н | |
| ANGE INCINCATION (13) | IGHEST PEAK (PSI) | |

| 1000 | | | WANGE DISTRIBUTION | 101100 | 2 | 100 |
|---|-------------|--------|--------------------|---------|------|--------|
| 1,000 1,1264 1,00 | | c | | c | × | c |
| 1,000 | | | | | | |
| 1,000 | - 10 - 10 m | | | | -1.5 | 1175 |
| 1,000 | 1 | | | | -12 | 141 |
| 2.44 3.40 3.54 3.54 3.00 3.54 3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.0 | | | 000 | | | 6,249 |
| | | | 000. | | | 6, 532 |
| 339 4,000 60,000 1,000 | | 244 | 000,2 | | 2.0 | 4,209 |
| | -8,000 | 229 | 3,000 | 0 | 0.1 | 2.874 |
| | -7,000 | 200 | 4,000 | 979 001 | 1:- | 3.85/ |
| | -0000 | 5 | 2,000 | 57 657 | 9 | 72057 |
| | -5.000 | 0 | 000.9 | 10010 | 5 | 944 |
| 1, 000 1, 0, 0, 000 1, 0, 0, 000 1, 0, 0, 000 1, 0, 0, 000 1, 0, 0, 000 1, 0, 0, 0, 000 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, | 4 000 | 11,264 | 7,000 | 38,011 | - 4- | 1,011 |
| | 000 | 44,630 | 000 | 19,410 | | 658 |
| 1000 631 1 | 2,000 | 4.658 | 000.0 | 3,753 | | 294 |
| 10,000 6.33 10,000 12,000 3.02 13, | - 2,000 | 166 | 000.6 | 118 | 7.5 | 598 |
| 1,000 205 1 1,000 205 1 1,000 205 1 1,000 205 1 1,000 205 1 1,000 205 1 1,000 205 1 1,000 205 1,000 2,004 | -1,000 | 13 | 10,000 | 633 | - | 111 |
| 12,000 342 27 27 27 27 27 27 27 | 0 | | 11,000 | 200 | 0 | 676 |
| 3,000 1,40 | 1,000 | 0 | 12,000 | 303 | - | 1,668 |
| 1,000 1,40 | 2,000 | 0 | 13.000 | 276 | .2 | |
| 1,000 1,644 39, 36, | 000 | 0 | 14 000 | 150 | 3 | 11,174 |
| \$\begin{array}{c c c c c c c c c c c c c c c c c c c | 2000 | 0 | 000 | 781 | ? * | 4,459 |
| 10,000 1,59 1,50 | 000.4 | 5 109 | 000,61 | +11 | 5. | 39,734 |
| 17,000 | 2,000 | 4/20 | 16,000 | 158 | 2. | 86,/33 |
| 8,000 2,047 3,000 2,04 | 000.9 | | 17,000 | 1400 | 9. | 20 640 |
| 10,000 1 | 7.000 | 2 | 18,000 | 2000 | -/- | 488 |
| 1000 | 8,000 | 0 | 19.000 | 4,041 | 8. | 1 |
| 54,346 51,000 46,65 1.0 61,6 61, | 000 | 4,527 | 20 000 | 1041 | 6 | 0 |
| \$3,749 21,000 2,55k 1.0 | 000 | 54,346 | 2000 | 4,645 | | 0 |
| 25,6c7 23,000 12,127 24,000 1,6,833 24,000 3,6,72 25,000 1,6,6,73 27,000 1,4,6,73 27,000 1,4,4,7 39,000 1,4,7 32,000 1,4,7 32,000 1,4,000 1,4,000 1,4,000 1,4,000 1,4,000 1,4,000 1,4,000 1,4,000 1,4,000 1,2,000 1,4,000 | 986,01 | 53,749 | 000,12 | %2% | 2: | 61,368 |
| | 000,11 | 25.607 | 22,000 | 4.250 | | |
| 24,000 3,872 2,500 4,642 2,000 3,47 1,44 30,000 77 77 13,000 72 23 33,000 72 23 33,000 73 74 75 76 77 77 78 79 70 70 70 70 70 70 70 70 70 70 | 12,000 — | 12 127 | 23,000 | 1,217 | | |
| 3,672 3,672 4,662 7,000 7,00 | 13,000 — | 12/12/ | 24,000 | 414 | | |
| 7, 000 1,254 1,254 1,254 1,000 3,44 1,000 1,4 1,000 1,4 1,000 1,2 1,000 1,2 1,000 1,2 1,000 1,2 1,000 1,2 1,000 1,000 1,000 1,2 1,000 1,00 | 14,000 | 2073 | 25,000 | 111 | | |
| 7, 000 34, 000 34, 000 1, 254 28,000 1, 47 30,000 1, 47 31,000 1, 2 33,000 1, 2 34,000 1, 2 34,000 1, 2 34,000 1, 2 34,000 1, 2 34,000 1, 2 34,000 1, 2 3,000 1, 3 1, | 15.000 | 2/0/6 | 26.000 | 1 | | |
| 344 28,000 1,44 39,000 1,44 39,000 1,44 31,000 1,44 1,45 | 16,000 | 4,643 | 27.000 | * | _ | |
| 344 114 125 120 120 120 120 120 120 120 120 | 17 000 | 7521 | 28 000 | 9/ | _ | |
| 74 33,000 47 31,000 77 32,000 78 36,000 78 35,000 | 000 | 344 | 20,000 | 07 | _ | |
| 77 30,000 47 31,000 72 33,000 74 34,000 75,000 76 77 77 77 77 77 77 77 77 77 | 18,000 | 711 | 000,62 | 7 | | |
| 47 23 33,000 23 33,000 7 34,000 7 35,000 | 19,000 | 74 | 30,000 | 1/2 | | |
| 23 33,000 72 34,000 73 34,000 74 35,000 7 35,000 | 20,000 | 77 | 31,000 | 90 | | |
| 33,000 | 21,000 | 23 | 32,000 | 8 | | |
| x - 4-w ~ - 0 | 22,000 | 200 | 33.000 | , | _ | |
| - MW 00 - 0 | 22,000 | 7/ | 34 000 | | _ | |
| #m ~ - 0 | 2000 | , | 36 000 | | | |
| | 74,000 | 4 | 35,000 | | | |
| | 25,000 — | 7 | | | | |
| | 26,000 | , | | | _ | |
| | 27,000 | , | | | | |
| | 28,000 | | | | | |
| | - | ٥ | | | _ | |

| DISTRIBUTION | u | 1,287 | 1,409 | 5446 | 2.35/ | 765/ | 607 | 000 | 767 | 305 | 3.8.2 | 10 | | 245 | 175 | 330 | 34.5 | 300 | 220 | 1,680 | 7,511 | 45.432 | 127.77 | | 24,670 | 709 | 0 | 0 | 26,946 | | | | | | | | | | | | | | | | | | | | | | |
|-------------------|-------------|---------|-------|------|---------|-------|--------|--------|---------|--------|--------|--------|--------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|--------|--------|--------|--------|--------|--------|----------|--------|--------|--------|--------|--------|---|---|
| R DIST | R | -1.5 | -1.2 | | 0.1 | 6 | 8 | 1 | 4 | 0.1 | 6.0 | 4 | 3 | | 7 | - | 0 | - | 2 | | ? • | 4. | -5. | 9. | 1 | | 0.0 | 7. | 0.1 | | | | | | | | | | | | | | | | | | | | | | |
| UTION | u | | | | | | - | 0 | 123,414 | 28,078 | 21216 | 2000 | 6,3/5 | 5,466 | 289 | 280 | 707 | 9 | 143 | 26 | 63 | 32 | 1 | 200 | 66 | 327 | 307 | 1.899 | 4.164 | 102 | 1003 | 306 | 63 | 20 | 3 | 2 | 80 | * | 7 | | 12 | | 0 | | | | | | | | - |
| RATE DISTRIBUTION | Pange (psi) | | | 000 | 000. | 7,000 | 3,000 | 4.000 | 000 | 000.6 | 000.0 | 7,000 | 8,000 | 000 | 000.6 | 000,01 | 000,11 | 12.000 | 13 000 | 14 600 | 14,000 | 000.61 | 16,000 | 17.000 | 000 81 | 000.00 | 000,61 | 000,02 | 000,12 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27.000 | 28,000 | 2000 | 000,62 | 30,000 | 31,000 | 32,000 | 33,000 | 34.000 | 35 (10)1 | 000.00 | | | | T | | |
| SUTION | u | | | 0 | 17 | 109 | 2 | 7 | 1/4/1 | 2,170 | A 1.80 | 200 | 12,758 | 1,254 | 42 | 6 | | | 0 | 0 | 0 | 1900 | 200 | 101 | /2 | 883 | 18,128 | 74.577 | 24.830 | 10./82 | 277 01 | 15 404 | 200 | 2034 | 2000 | 1,557 | 177 | 99/ | 7/1 | 77.00 | | 200 | 11 | ^ | > | 5 | 2 | - | T | 0 | |
| PEAK DISTRIBUTION | Peak (psi) | -12 000 | 000 | 000 | -10,000 | -0000 | -8,000 | -7 000 | 0000 | 0000 | -5,000 | -4.000 | -3,000 | 0000 | 2,000 | 000,1- | 0 | 1,000 | 2 000 | 2000 | 3,000 | 4,000 | 2,000 | 000 | 2,000 | 000,0 | 8,000 | 000,6 | 10,000 | 11,000 | 12,000 | 13,000 | 14,000 | 15,000 | 16.000 | 17,000 | 000 | 18,000 | 19,000 | 20,000 | 21,000 | 22.000 | 23.000 | 24 000 | 2000 | 000,62 | 25,000 | 27,000 | 28.000 | | |

TABLE B-15 SPECTRUM BS123.MM9 (NO. 15)

DESCRIPTION: MISSION 1, 2 AND 3 MIX (NO TRAINING)

| FLIGHT HOURS | | 2,500 | . 2,500 FLIGHTS = 2,239 LANDINGS = 2 | LANDINGS | | 7 |
|--------------------------------|----|---------|--------------------------------------|------------------------|----|---|
| TOTAL CYCLES | - | 177,528 | AVERAGE NO. OF CYCLES PER: | FLIGHT | - | 1 |
| RANGE TRUNCATION (PSI) = 4,000 | 11 | 4,000 | | FLIGHT HOUR | - | 1 |
| HIGHEST PEAK (PSI) | 11 | 23,296 | SMALLES | MALLEST VALLEY (PSI) = | 11 | 1 |

| | | 2,500 | FLIGHTS = 2,239 | LANDINGS | = 2 | ,239 | FLIGHT HOURS | 11 |
|------------------------|----|---------|-----------------|--------------------------------|-----|---------|------------------------|----|
| | | 177,528 | 5 | FLIGHT | - 7 | 79.3 | TOTAL CYCLES | 11 |
| RANGE TRUNCATION (PSI) | 11 | 4,000 | | FLIGHT HOUR | 7 = | 1.0 | RANGE TRUNCATION (PSI) | Ħ |
| HIGHEST PEAK (PSI) | 11 | 23,296 | SMALLES | SMALLEST VALLEY (PSI) = -24,29 | | -24.298 | HIGHEST PEAK (PSI) | н |

FLIGHTS = 2,489

AVERAGE NO. OF CYCLES PER: FLIGHT = 80.6

FLIGHT HOUR = 80.2

SMALLEST VALLEY (PSI) = -24,298

DESCRIPTION: SPECTRUM NO. 6 WITH 50 PERCENT REDUCTION IN TRAINING

TABLE B-16 SPECTRUM BS6.MM10 (NO. 16)

| Peak (ps1) | PEAK DISTRIBUTION | BUTION | RANGE DISTRIBUTION | UTION | R DISTR | DISTRIBUTION |
|---|-------------------|--------|--------------------|--------|---------|--------------|
| 1000 | 1 | U | | u | c· | c |
| 1000 1 | | | | | | |
| 1000 | | 0 | | | | 148 |
| 1000 1 1 1 1 1 1 1 1 | -12,000 | 50 | | | | 529 |
| 1000 | -000,11- | 0 | - | | 7.1- | 307 |
| 28 3,000 0 0 0 0 0 0 0 0 0 | -10,000 | 5/ | 000 | | - | 833 |
| 1000 | -000.6- | 18 | 2,000 | | 9.0 | 370 |
| 1,000 1,00 | -8,000 | 3/6 | 3,000 | 0 | 20.1 | 782 |
| 1,425 1,000 2,105 1,00 | -7,000 | 936 | 4,000 | 76.226 | - | 544 |
| \$\begin{array}{c c c c c c c c c c c c c c c c c c c | -0000 | 52h" | 2,000 | 81.015 | 9. | 130 |
| 1,000 6,498 -3 1,000 6,498 -3 1,000 6,498 -3 1,000 7,204 -3 | -2,000 | 2324 | 000.9 | 27,938 | .: | 43 |
| 1000 2,000 | -4,000 | 6.912 | 000,7 | 8,498 | 4 | 43 |
| 1,000 1,204 1,000 1,204 1,000 1,204 1,000 1,00 | -3,000 | 757 | 8,000 | 2,000 | | 52 |
| 1,000 331 0 0 0 0 0 0 0 0 0 | -5,000 | 63 | 000.6 | 1,204 | 7 | 25 |
| 1,000 9k | 000.1- | 2 | 000,01 | 331 | - " | 42 |
| 13,000 4,0 13,000 13,0 | 7 | 0 | 000.11 | 96 | 0. | 16 |
| 3,000 7 3,000 3,000 7 3,000 | 1,000 | 0 | 12,000 | 43 | | 761 |
| 14,000 | 2,000 | 0 | 13,000 | 6 | 7. | LAL |
| 1000 | 3,000 | C | 14,000 | " | .i. | 2,763 |
| 17,000 7,0 | 4,000 | /80 | 15,000 | 80 | 4. | 13,460 |
| 121 1,000 10 10 10 10 10 10 | 2,000 | 249 | 16,000 | 0 | i. | 54,790 |
| 1,45 | 9,000 | 121 | 000.71 | 0/ | 0.1 | 111,37 |
| 1000 15 15 15 15 15 15 1 | 7,000 | 54/ | 000.81 | 63 | | 406 |
| 1.0 1.5 1.0 1.5 1.0 1.5 1.0 1.5 | 8,000 | 2,470 | 000,61 | 92 | 0,0 | 0 |
| 12, 1000 657 100 12, 100 1 | 000.6 | 9,598 | 000,02 | 257 | J | 0 |
| 25,792 20,002 8,447/ 8,447/ 8,447/ 8,600 13,000 13,000 12,27 17,27 17,27 17,27 17,27 17,27 17,27 17,27 17,27 17,27 17,27 18,000 19 | 10,000 | 40,275 | 000.12 | 158 | 0. | 12,728 |
| 23.000 26.47 3.006.0 3.006.0 7.2.72 7.2.72 7.000 7.2.72 7.000 7.000 6.00 1.000 6.00 1.0 | 000,11 | 39,190 | 000,22 | 830 | | |
| 25,000 7,767 7,767 7,767 7,767 1 | 12,000 | 111-14 | 23,000 | 305 | | |
| 25.000, 25.000, 26.000, 26.000, 27.0000, 27.000, 27.000, 27.000, 27.000, 27.000, 27.000, 27.000, 27.000, 27.000, 27.000, 27.000, 27.000, 27.000, 27.000, 27.000, 27.00 | 13,000 | 6,647 | 000,47 | 59 | | |
| 7,272 7,67 7,67 7,600 2,300 6,000 1, | 14,000 | 33,080 | 000.52 | 510 | | |
| 28,000 29,000 29,000 20,000 | 12,000 | 7.272 | 000.97 | 8/ | | |
| 25.000 25.000 25.000 25.000 25.000 25.000 25.000 25.000 25.000 27.000 27.000 28.000 28.000 29.000 29.000 29.000 39.000 | 16,000 | 1767 | 000.17 | 184 | | |
| 000° 5E | 17,000 | 09/ | 28,000 | 28 | | |
| 000, 18 | 18,000 | 230 | 29,000 | 9 | | |
| 31,000 31,000 32,000 34,000 36,000 | 19,000 | 07 | 30,000 | | | |
| 32,000 31,000 31,000 32,000 | 20,000 | ī | 31,000 | 2 | | |
| J 7 - 0 | 21,000 | 1 | 32,000 | 0 | | |
| 0 | 22,000 | 7 7 | 33,000 | | | |
| 0 | 23,000 | | 34,000 | | | |
| 25,000 | 24,000 | 0 | 35,000 | | | |
| | 75,000 | | | | | |

| | PEAK DISTRIBUTION | LION | RANGE DISTRIBUTION | NOTION | R DIST | DISTRIBUTION |
|--|-------------------|-------|--------------------|--------|--------|--------------|
| 1000 | | c | | c | æ | c |
| 1,000 1,00 | + | - | | | | 96 |
| 1,000 1,00 | -12,000 | 48 | | | 5.1- | 527 |
| 1,000 | -11,000 | | | | -1.2 | 65 |
| 2,000 2, | -10,000 | (3 | 000 | | 0.1- | 582 |
| 1,000 1,454 1,000 1,45 | -000.6- | 30 | 2,000 | | 6 | 224 |
| 1,44 5,000 63,344 7 5,000 63,344 5 5,000 55,767 5 5,000 5,767 5 5,000 5,767 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 7,567 5 5,000 5 5,0 | -8,000 | 21.0 | 3,000 | | 8:- | 123 |
| 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | -7,000 | 797 | 4,000 | | 7 | 180 |
| \$\frac{\lambda}{\lambda} \frac{\lambda}{\lambda} \frac | -6.000 | 141 | 5,000 | 20,01 | 9:- | 745 |
| 1, 257 1,000 25,554 1,000 2,55 | -5.000 | 1,141 | 000 | 13,161 | 5 | 56/ |
| \$\begin{array}{c c c c c c c c c c c c c c c c c c c | 4.000 | 1,593 | 7,000 | 25,556 | - 4 | 27 |
| 1,454 1,100 1,454 1,100 1,10 | 000 | 5,159 | 0000 | 7,580 | | 25 |
| 1,000 1,465 1,000 1,00 | 2000 | 595 | 000 | 1,454 | | , |
| 1,000 275 | 2,000 | 23 | 000.00 | 1.165 | 7:- | 35 |
| 1,000 | 0001- | 2 | 000,01 | 275 | : | 9 |
| 12,000 | - | 0 | 000,11 | 20 | | 9 |
| 3,000 2, | 000, | | 12,000 | 20 | - | 100 |
| 14,000 7 14,000 7 14,000 7 14,000 7 14,000 7 14,000 7 15,000 7 15,000 7 16, | 2,000 | 0 | 13,000 | 1 | .2 | 9:0 |
| 15,000 | 3.000 | 0 | 14.000 | 0 | 3 | 900 |
| 1,000 5 | 000 | 0 | 16 000 | 7 | ? . | 1,997 |
| 1,5¢ 1,000 5 | 000 | 0 | 000 | 9 | • | 2/6.8 |
| 1,700 8 7,66, | 000,0 | 156 | 000,01 | S | 0. | 46,552 |
| 18,000 9,8 18,000 9,8 18,000 9,8 18,000 9,8 18,000 9,8 1,0 1 | 0,000 | 117 | 000,7 | 90 | 0.1 | 106, 539 |
| 1,000 84 | 2,000 | 77 | 000,81 | 86 | - | 840 |
| 1,864 20,000 84 36,975 21,000 349 36,975 22,000 6.77 42,544 24,000 23,00 42,544 24,000 23,00 4,676 24,000 27,00 2,000 27,00 27,00 2,000 27,00 27,00 2,000 27,00 27,00 2,000 27,00 27,00 3,000 29 33,000 3,000 34,000 35,000 | 8,000 | 67/ | 000,61 | 700 | 80. | 0 |
| 1.00 349 1.0 2 1.0 2 2 2 2 2 2 2 2 2 | - | 1869 | 20,000 | 200 | 6. | 0 |
| 3,374 22,000 6,77 42,594 23,000 6,77 42,594 23,000 6,77 24,622 25,000 4,625 6,823 27,000 27 6,823 27,000 27 28,000 29 30,000 29 31,000 29 33,000 33,000 33,000 33,000 | | 975 | 21,000 | 340 | 1.0 | 6697 |
| 23,000 2,594 2,500 2,000 2,863 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 3 | 1 | 2111 | 22,000 | | | 1197 |
| ### ### ### ### ### #### #### ######## | 1 | 1,374 | 23.000 | 617 | | |
| 7462 31,662 6,882 6,882 6,882 7,576 000,62 000,02 000,02 000,02 000,02 000,03 000, | | 2,544 | 000 | 221 | | |
| 3, 900 1, 576 1, 576 1, 576 1, 576 2, 000 2, 000 2, 000 3, 000 | | 7402 | 000,42 | 62 | | |
| 20,000 1,574 27,000 20,000 20,000 20,000 3,00 | | 1,863 | 000.62 | 485 | | |
| 27,000 27,000 28,000 30,000 30,000 30,000 31,000 | - | 6.823 | 700,42 | 27 | | |
| 25 / 25 / 25 / 25 / 25 / 25 / 25 / 25 / | + | 1 574 | 27,000 | 213 | | |
| 2000,000 2000,0 | + | 521 | 28,000 | 29 | | _ |
| 30,000 31,000 31,000 32,000 35,000 35,000 | 18,000 | 300 | 29,000 | 1 | | |
| 3,000 | 19.000 | 101 | 30,000 | | | |
| P OM- | 20.000 | 00 | 31,000 | 0 | | |
| 0m- | 21,000 | 6 | 32 000 | | | |
| 6 | 000,12 | 0 | 35,000 | | | |
| | 77,000 | 3 | 33,000 | | | |
| | 23,000 | - | 34,000 | | | |
| | 24,000 | | 35,000 | | | |
| 24,000 | 25,000 | | | | | |
| 27,000 | 26,000 | | | | | |
| | 27,000 | | | | | _ |
| | + | | | | | |
| | | | | | | |

TABLE B-17 SPECTRUM BS13.MM11 (NO. 17)

DESCRIPTION: FLIGHTS 1A AND 3A MIX (LOW PAYLOAD), NO TRAINING

| LIGHT HOURS | 11 | 2,500 | FLIGHTS = 3,567 | LANDINGS | 3,567 |
|------------------------|----|---------|----------------------------|------------------------|---------|
| OTAL CYCLES | 11 | 423,414 | AVERAGE NO. OF CYCLES PER: | FLIGHT | 118.7 |
| RANGE TRUNCATION (PSI) | Н | 4,000 | | FLIGHT HOUR = | 169.4 |
| IGHEST PEAK (PSI) | н | 22,028 | SMALLEST | MALLEST VALLEY (PSI) = | -24,298 |

FLIGHT HOURS = 2,500

TOTAL CYCLES = 105,785

RANGE TRUNCATION (PSI) = 4,000

HIGHEST PEAK (PSI) = 23,296

DESCRIPTION: FLIGHTS 1B, 2 AND 3B MIX (HIGH PAYLOAD), NO TRAINING

TABLE B-18 SPECTRUM BS123.MM12 (NO. 18)

| DISTRIBUTION | c | S | 152 | 106 | 626 | /63 | 536 | 111 | /32 | 67 | 0 | 0 | , | 3 | 01 | 32 | 1/18 | 658 | 3,646 | 24,791 | 69,416 | 1.090 | 0 | 0 | 4.78 | | | | | | | | | | | | | | | | | | | |
|--------------------|-------------|---|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------------------|----------|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|
| R DIST | ď | | 0.0 | 7.1- | 0.1- | 7 | 1.0 | 1 | 0.1 | C:- | 4.0 | 2.0 | 3.5 | | 0 - | - 0 | 7: | 2. | 4. | 6. | 0.1 | | 80. | 6. | 1.0 | The state of the state of | | and the same of th | - | | | | | | | | | | | | | | | |
| UTION | c | T | | | | | 0 | 169.01 | 65.8C4 | 20,601 | 5.065 | 4/6 | 1,047 | 235 | 57 | 21 | , | S | 0 | 0 | 0 | 4 | 92 | 4/ | 18 | 466 | 107 | 000 | 202 | 100 | 36 | 753 | 26 | 12 | 0 | , | | | | | I | | | |
| RANGE DISTRIBUTION | Range (psi) | | | | 000,1 | 2,000 | 3,000 | 000,4 | 2,000 | 000,0 | 000, | 000,00 | 000.6 | 000,01 | 000,11 | 12,000 | 13,000 | 14,000 | 15,000 | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 21,000 | 22,000 | 23,000 | 24.000 | 25,000 | 26.000 | 27,000 | 28,000 | 29 000 | 30 000 | 000,10 | 31,000 | 32,000 | 33,000 | 34,000 | 35,000 | | | | - |
| BUTION | c | 0 | 79 | 0 | " | 0 | 345 | 1.038 | 1.507 | 169 | 504 | 3 | 0 | 4 | | | | | | F | | C | 99 | 157 | 922 | 1 200 | 1001 | 41.000 | 5,850 | 40,312 | 8,573 | 1,976 | /43 | 566 | 09 | 1/2 | 0 | | 3 | | | | | |
| PEAK DISTRIBUTION | Peak (psi) | | -12,000 | 000'11- | -10,000 | -000.6- | -8,000 | -7,000 | -6,000 | -2,000 | -4,000 | -3,000 | -2,000 | 000.1- | 0000 | 000 | 2,000 | 3,000 | 4,000 | 2,000 | 000.9 | 7,000 | 8,000 | 000.6 | 10,999 | 11,000 | 12,000 — | 13.000 | 14,000 | 15 000 | 16,000 | 17,000 | 000 | 000 | 000,60 | 70,000 | 21,000 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 | - |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| 1,000 | PEAK DISTRIBUTION | NOT | KANGE DISTRIBUTION | NOTION | C10 A | NOT LOOK THE TOTAL |
|--|-------------------|--------|--------------------|----------|-------|--------------------|
| 1000 | | c | | c | ~ | c |
| 1,000 | + | T | | | | 6// |
| 1,000 | 12,000 | T | | | 2.0 | 1,441 |
| 1,000 | 000 | | | | 7.1- | 45 |
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| 256.999 24,000 26,255 27,000 37,999 26,000 27,00 | - | 58 472 | 000,12 | 1,426 | 0.1 | |
| 23,000 2,2,254 2,2,000 3,4,99 2,5,000 2,5,000 2,7 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 3,000 2,000 3 | 1 | 566 85 | 000,22 | 1.425 | | |
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| 25,000 3,449 429 251 27,000 27 28,000 27 29,000 20 31,000 20 31,000 34,000 34,000 35,000 35,000 | + | 2000 | 24,000 | a | | |
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| 27,000 | 76,000 | | | | | |
| | 27,000 | T | | | | |
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TABLE B-19 SPECTRUM BS6.MM13 (NO. 19)

AVERAGE NO. OF CYCLES PER: FLIGHT = 28.3 FLIGHT HOUR = 20.8 SMALLEST VALLEY (FSI) = -24.298 DESCRIPTION: SPECTRUM NO. 6 WITHOUT LOW-ALTITUDE PENETRATION FLYING FLIGHT HOURS = 2.500

TOTAL CYCLES = 51.896

RANGE TRUNCATION (PSI) = 4.000

HIGHEST PEAK (PSI) = 25.153

DESCRIPTION: SPECTRUM NO. 6 WITH 100 PERCENT INCREASE IN LOW-ALTITUDE

PENETRATION FLYING TIME

FLIGHT HOURS = 2.500

TOTAL CYCLES = 312.646

RANGE TRUNCATION (PSI) = 4.000

HIGHEST PEAK (PSI) = 23.296

TABLE B-20 SPECTRUM BS6.MM14 (NO. 20)

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| Peak (psi) | • | ı | | | |
|------------|--------|-------------|---------|------|---------|
| | | Range (ps1) | c | œ | c |
| | , | | | | 1/0 |
| -12,000 | 3 | | | 5.7 | 2// |
| -11,000 | 0 | | | -1.2 | 429 |
| -10,000 | 26 | 000, | | -1.0 | 1.078 |
| -0,000 | 0 | 2,000 | | 6. | 497 |
| -8,000 | 126 | 3,000 | 0 | 0.1 | 973 |
| 000.7 | 1852 | 000.4 | 125.152 | 1:- | 270 |
| 000.9- | 2.799 | 2,000 | 125.469 | 0. | 76 |
| 2,000 | 1.960 | 000,4 | 4.103 | | 19 |
| -4,000 | 8.45/ | 7,000 | 11.8% | 4 | 47 |
| 3,000 | 101 | 8,000 | 2 600 | 3 | 3/ |
| 2,000 | 1011 | 000.6 | 6,40 | 2 | 63 |
| 1,000 | - | 10,000 | 1,016 | 7 | 3 |
| 0 | 2 | 11,000 | 404 | 0 | 2 2 |
| 1.000 | 0 | 12.000 | 42/ | - | 124 |
| 2000 | 0 | 13 000 | 59 | 2 | 345 |
| 2000 | 0 | 000 | " | 1,0 | 1,330 |
| 3,000 | 0 | 14,000 | /3 | ? • | 5,470 |
| 4,000 | 232 | 000.61 | 6 | 4. | 26,683 |
| 2,000 | 5/9 | 000,01 | 6 | 5. | 89,827 |
| 0000,9 | 461 | 17,000 | 542 | ا به | 166,932 |
| 7,000 | 374 | 18,000 | 117 | 7. | 626 |
| 8,000 | 6.617 | 19,000 | 67 | 80. | 0 |
| 0000.6 | 27,379 | 20,000 | 4/4 | 6. | 0 |
| 0,000 | 62,480 | 21,000 | 1.183 | 0.1 | 14.441 |
| 1,000 | 59.780 | 22,000 | 116 | | |
| 2,000 | 65,803 | 23,000 | 308 | | |
| 13,000 | 9,246 | 24,000 | 63 | | |
| 4,000 | 49.948 | 000,62 | 754 | | |
| 2,000 | 10.663 | 26,000 | 32 | | |
| 16,000 | 2,606 | 27,000 | 211 | | |
| 17,000 | 209 | 28,000 | 28 | | |
| 8,000 | 340 | 29,000 | 7 | | |
| 19,000 | 86 | 30,000 | - | | |
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| 000'17 | | | | | |

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|--------------------|-------------|---|-----|-------|------|---------|--------|-------|--------|--------|--------|--------|-------|-------|--------|--------|--------|--------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|
| DISTRIBUTION | c | | 36/ | 837 | 487 | 170 | 9/9 | 456 | 435 | 344 | | 163 | 111 | 49 | 62 | 57 | 99 | 10 | 104 | 154 | 232 | 300 | 211 | 6,592 | 15,931 | 11,909 | 605 | 0 | | | 11,020 | | | | | | | | | | | | | | | | | | | | | |
| R DISTR | R | | | 2 | 7.1- | 0.1- | 6 | 0 | 0.1 | 1 | 9 | - 5 |) < | 1. | 2 | 7 | | 0 | | - 6 | 7. | . s | 4 | 4 | | 9.5 | | 8. | 6. | 0.1 | 2 | | | | | | | | | | | | | | | | | | | | | |
| UTION | - | | | | | | | | 0 | 25 (30 | 100,00 | 8,222 | 8,238 | 3,485 | 2090 | 269 | 100 | 100 | 53 | 42 | 12 | 3, | 0 | 12 | 9/ | 15 | 108 | /30 | 200 | 200 | 1,215 | 957 | 437 | 122 | 24 | 9 | 124 | 127 | 10 | 2 | 1 | - | ^ | | 0 | | | | | | | |
| RANGE DISTRIBUTION | Range (psi) | | | | | 000 | 2.000 | 3 000 | 2000 | 4,000 | 5.000 | 000 | 000 | 000,0 | 8,000 | 9,000 | 10,000 | 11 000 | 2000 | 000.21 | 13,000 | 14,000 | 15.000 | 16,000 | 2000 | 000,71 | 000,81 | 19,000 | 20,000 | 21,000 | 2000 | 000.22 | 23,000 | 000,47 | 75,000 | 26,000 | 27,000 | 28,000 | 29,000 | 30 000 | 2000 | 31,000 | 32,000 | 33 000 | 3000 | 34,000 | 35,000 | | | 1 | | 1 |
| NOITUS | c | | 0 | 19 | 0 | | 3 | 37 | 273 | 202 | 3.0 | 244 | 3,728 | 5,650 | 375 | 11 | | 0 | 0 | 0 | 0 | | 0 | 496 | 463 | 0/ | 3/5 | 2777 | 77.13 | 1,176 | 6,734 | 3,699 | 5,957 | 8,122 | 2 464 | 1 302 | 473 | 412 | 141 | 2/ | 34 | 3/ | , | | * | / | , | - | | | | |
| PEAK DISTRIBUTION | Peak (psi) | | | 2,000 | 000 | -10,000 | -0.000 | 000 | 000.0- | -7,000 | -6.000 | -5,000 | 000 | 000.4 | -3,000 | -2,000 | -1,000 | | 000 | 000, | 7,000 | 3,000 | 4.000 | 2000 | 000 | 000 | 000. | 8,000 | 000.6 | 10,000 | 000 | 000,11 | 000,71 | 3,000 | 14,000 | 15,000 | 16,000 | 17.000 | 18,000 | 000 01 | 000,61 | 20,000 | 21,000 | 22 000 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27 000 | 2001.2 | |

TABLE B-21 SPECTRUM BS1.SM1 (NO. 21)

DESCRIPTION: SPECTRUM NO. 1 WITH LO-HI-LO FLIGHT SEQUENCE

| 3S = 2.528 | = 18.1 | HOUR = 18.3 | (PSI) = -24.298 | |
|-----------------|----------------------------|------------------------|----------------------|--|
| LANDIN | FLIGHT | FLIGHT HOUR | MALLEST VALLEY (PSI) | |
| FLIGHTS = 2,528 | AVERAGE NO. OF CYCLES PER: | | SMALLES | |
| 2,500 | 45,807 | 4,000 | 22,114 | |
| H | Ħ | Н | П | |
| LIGHT HOURS | TOTAL CYCLES | RANGE TRUNCATION (PSI) | GHEST PEAK (PSI) | |

FLIGHTS = 2.422 LANDINGS = 3.843

AVERAGE NO. OF CYCLES PER: FLIGHT = 75.0

FLIGHT HOUR = 72.7

SMALLEST VALLEY (PSI) = -24.298

DESCRIPTION: SPECTRUM NO. 6 WITH LO-HI-LO FLIGHT SEQUENCE

SPECTRUM BS6.SM1 (NO. 22)

TABLE B-22

| DISTRIBUTION | u | 112 | 869 | 559 | 698 | 064 | 424 | 333 | 197 | 20 | 1 0 | 000 | 44 | 1 6 | | 611 | 243 | 793 | 3,155 | 16,125 | 52,775 | 89,731 | 834 | 0 | 0 | 13,446 | | | | | | | | | | | | | | | | |
|--------------------|-------------|-----|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|
| R DIST | R | | 0.1 | 2.1- | -1.0 | 6.1 | 2. | | 9 | 5 | 4 | 3 | 2 | | 0 | | 2 | 7. | ? * | 4. | 0. | 0. | | 000 | 7.0 | 0.1 | | | | | | | | | | | | | | | | |
| 101100 | u | | | | | | 0 | 656 nL | 59/ 77 | 0/0 70 | 1001 | 100% | 2,376 | 1,040 | 5/7 | 26 | 53 | 50 | Ŧ | 9 | " | 31 | 88 | 117 | 435 | 1,113 | 11.6 | 427 | 117 | 367 | 22 | 191 | 54 | 9 | 1 | 0 | | | | | - | |
| KARGE DISTRIBUTION | Cange (pri) | | | - | 1,000 | 2,000 | 3,000 | 4,000 | 2,000 | 0000,9 | 7,000 | 8,000 | 000.6 | 10,000 | 11.000 | 12,000 | 13,000 | 000,01 | 14,000 | 000,61 | 000,01 | 000,71 | 000,00 | 000,60 | 20,000 | 000,17 | 22,000 | 200,02 | 25,000 | 25,000 | 27.00 | 28 000 | 29.000 | 30 007 | 30,00 | 31,000 | 32,000 | 33,000 | 34,000 | 35,000 | | |
| 101100 | C | 0 | 24 | 0 | 6 | 0 | 102 | 7/6 | 1,000 | 2050 | 200 | 1,01 | 136 | 40 | 7 | 0 | 0 | 0 | 0 | 384 | 358 | 95 | 246 | 4.197 | 17,220 | 34,344 | 31,833 | 36,061 | 3/0/6 | 26,378 | 820'9 | 1,565 | 184 | 141 | 63 | 9/ | 7 | 7 | | | ١ | |
| PEAK DISTRIBUTION | Peak (psi) | | -12,000 | 000'11- | -10,000 | -9,000 | -8,000 | -/,000 | 000,9- | -5,000 | -4,000 | -3,000 | -2,000 | -1,000 | 0 | 1.000 | 2,000 | 2,000 | 2,000 | 4,000 | 000.6 | 0000 | 000, | 000,8 | 000,60 | 10,000 | 000,11 | 12,000 | 14 000 | 15,000 | 16.000 | 17 000 | 18.000 | 10 000 | 0000 00 | 20,000 | 21,000 | 22,000 | 23,000 | 24,000 | 25,000 | 26.000 |

| 1,000 2, | 100111 | . 17 | DISTALBUTION | | |
|--|----------|--------|--------------|------|--------|
| 1,000 2,000 3,000 2,000 4,000 3,000 4,000 4,000 4,000 4,000 4,469 6,000 4,000 4,469 7,000 4,000 1,000 | (psi) n | (psi) | - | 2 | |
| 1,000 2,000 2,000 4,000 4,000 6,386 6,000 6,386 6,000 6, | | | | | 1/2 |
| 1,000 | -12,000 | | | 5.1 | 1,088 |
| 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 1, | 000/11- | | | 7.1- | 28 |
| 2,000 4,000 6,386 6,000 6, | | 1,000 | - | 0.1- | 5/ |
| 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7 | | 2,000 | | 6 | 98 |
| 7. 22,000, 4,000, 6,000 | | 3,000 | 0 | | 161 |
| \$\frac{5\infty}{\(\beta\)}\\ \frac{5\infty}{\(\beta\)}\\ \frac{5\infty}{\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | | 4,000 | 22.091 | 1:- | 231 |
| 1,000 1,00 | | - | 0877 | 9 | 303 |
| 1,000 1,00 | + | - | 200 | 5 | 100 |
| 1,000 1,614 1,61 | 1 | T | 16,041 | 4 | |
| 1000 1362 | | | 4,614 | - 3 | 25 |
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| 15,000 | | 14 000 | 41 | 3 | 233 |
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| 1,000 | | 000,61 | /2 | J | 3,897 |
| 1,000 1,00 | 67 | 16,000 | 7 | S. | 13,076 |
| 18,000 19 19 19 19 19 19 19 | 1 | 17,000 | 0 | 9. | 12 294 |
| 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1 | + | 18,000 | 9 | .7 | 1,21,0 |
| 1.0 | + | T | 100 | 8. | 0.51 |
| 7.7.7.5 21,000 27.6 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 1 | Т | 177 | 6. | 0 |
| 7, 103 6, 476 6, 471 6, 471 1, 103 1, 103 | 4,795 | - | 101 | 1 0 | 0 |
| 1,111 1,112 1,1,103 | | | 862 | 2 | 11,665 |
| 00,422 24,000 1,703 24,000 3,476 25,000 2,476 26,000 2,476 26,000 1,528 26,000 2,000,25 26,000 1,528 26,000 2,000,25 26,000 1,000,25 | - | | 1,372 | | |
| 24,000 1,520 27,000 28,000 28,000 28,000 28,000 1,520 29,000 1, | | | 454 | | |
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| 000, 25. 000 000 000 000 000 000 000 000 000 0 | - | | " | | |
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| | | 34,000 | | | |
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TABLE B-23 SPECTRUM BS6.SM4 (NO. 23)

DESCRIPTION: SPECTRUM NO. 6 WITH SPECIFIC FLIGHT SEQUENCE

DESCRIPTION: SPECTRUM NO. 6 WITH A DIFFERENT RANDOM FLIGHT SEQUENCE

TABLE B-24 SPECTRUM BS6.SM5 (NO. 24)

| FLIGHT HOURS | н | 2,500 | FLIGHTS = 2,422 LANDINGS = | DINGS | 3,843 | ш. |
|------------------------|---|---------|---------------------------------|--------------|---------|----|
| TOTAL CYCLES | | 181,802 | AVERAGE NO. OF CYCLES PER: FLIG | . THE | | F |
| RANGE TRUNCATION (PSI) | H | 4,000 | FLIG | SHT HOUR : | 72.7 | 8 |
| HIGHEST PEAK (PSI) | н | 23,923 | SMALLEST VAL | LLEY (PSI) = | -24,298 | I |

| | TOTAL DELICATION OF THE PARTY O | . 1 | UTION | ~ | DISTRIBUTION |
|----------|--|-------------|--------|------|--------------|
| (151) | U | Pange (psi) | L | A. | u |
| 1 | 0 | | | | 278 |
| -12,000 | 64 | | | 5.1 | 693 |
| 000'11- | 0 | | | 7.1- | 558 |
| -10,000- | 9/ | 000, | | 0.1- | 808 |
| 33 | 0 | 000,5 | | 7.0 | 757 |
| 2,000 | 802 | 2,000 | 0 | 0.1 | 929 |
| 000 | 116 | 000.4 | 75,232 | | 33/ |
| 300 | 1,450 | 000,0 | 66,231 | 0.1 | 204 |
| 000,0- | 3,049 | 0000 | 24,686 | C | 16 |
| 600 | 7006 | 000,7 | 7.899 | 4 | 55 |
| -3,000 | 242 | 8,000 | 2.357 | | 67 |
| 000 | 26 | 000,6 | 1.044 | 7 | 69 |
| -1,000 | 2 | 000,01 | 270 | - | 78 |
| 0 | 0 | 11,000 | 66 | 0 | 1/8 |
| 000, | 0 | 12,000 | 45 | - | 251 |
| 2,000 | 0 | 13,000 | 61 | .2 | 184 |
| 3,000 | 0 | 14,000 | * | .3 | 3.088 |
| 4,000 | 384 | 15,000 | 01. | 4. | 16.174 |
| 00 | 358 | 16,000 | " | -5. | 52.908 |
| 000,9 | 95 | 17,000 | 62 | 9. | 89.728 |
| 7,000 | 240 | 18,000 | 111 | 1. | 830 |
| 8,000 | 4,273 | 19,000 | 121 | , a | 0 |
| 000 | 17,233 | 70,000 | hhh | 6. | 0 |
| | 34,449 | 000,12 | 1,114 | 0.1 | 13,495 |
| | 31,847 | 000,22 | 643 | | |
| | 36,076 | 23,000 | 404 | | |
| | 8,990 | 000,47 | 93 | | |
| | 26,285 | 000,62 | 405 | | |
| | 6,040 | 000,02 | 21 | | |
| 12,000 | 1,564 | 000,00 | 12) | | |
| 30 | 186 | 20,000 | 22 | | |
| 18,000 | 197 | 29,000 | 5 | | |
| 000,61 | 63 | 30,000 | 0 | | |
| 20,030 | 1/4 | 31,000 | | | |
| 00 | 7 | 32,000 | | | |
| 22,000 | 7 | 33,000 | | | |
| 00 | | 34,000 | | | |
| 90 | 0 | 35,000 | | | |
| 25,000 | | | | | |
| 8 | | 1 | | | |
| 27,000 | T | | | | |
| + | T | 1 | | | |
| - | | | | | _ |

AVERAGE NO. OF CYCLES PER: FLIGHT = 75.1

SMALLEST VALLEY (PSI) = -24,298 DISTRIBUTION 8.7.1. 8. × 25.2227 1006 100 RAIGE DISTRIBUTION (ange (psi) 1,000 4,000 1, = 2.500
TOTAL CYCLES = 181,859
RANGE TRUNCATION (PSI) = 4,000
HIGHEST PEAK (PSI) = 23,923 265 4002 17257 172 PEAK DISTRIBUTION Peak (psi) 1, 000

TABLE B-25 SPECTRUM BS1A.FL1 (NO. 25)

DESCRIPTION: FLIGHT 1A - 0.541 HOUR DURATION

| LANDINGS = 4,621 FLIGHT = 18.5 FLIGHT HOUR = 34.1 ST VALLEY (PSI) = -24,298 | 2.500 FLIGHTS = 4.621 LANDINGS = 4.621 FLIGHT HOURS 85.331 AVERAGE NO. OF CYCLES PER: FLIGHT HOUR = 18.5 TOTAL CYCLES 4.000 FLIGHT HOUR = 34.1 RANGE TRUNCATION (PSI) 19.353 SMALLEST VALLEST (PSI) = -24.298 HIGHEST PEAK (PSI) | FLIGHTS = 4.621 AVERAGE NO. OF CYCLES PER: FLIGHT = 18.5 FLIGHT HOUR = 34.1 SMALLEST VALLEY [RS] = -24.298 |
|---|---|---|
| FLIGHTS = 4.621 AVERAGE NO. OF CYCLES PER: FLIGHT = 18.5 FLIGHT HOUR = 34.1 SMALLEST VALLE Y (18)1 = -24.298 | FLIGHTS = 4.621 AVERAGE NO. OF CYCLES SM | FLIGHTS = 4.621 AVERAGE NO. OF CYCLES SM |
| FLIGHTS = 4.621 AVERAGE NO. OF CYCLES PER: FLIGHT = FLIGHT HOUR = SMALLEST VALLEY (PSI) = | FLIGHTS = 4.621 AVERAGE NO. OF CYCLES SM | FLIGHTS = 4.621 AVERAGE NO. OF CYCLES SM |
| FLIGHTS = 4.6.2] AVERAGE NO. OF CYCLES PER: FLIGHT FLIGHT HOL SMALLEST VALLEY (78) | FLIGHTS = 4.621 AVERAGE NO. OF CYCLES SM | FLIGHTS = 4.621 AVERAGE NO. OF CYCLES SM |
| FLIGHTS = 4.621 AVERAGE NO. OF CYCLES PER: SMALLE: | FLIGHTS = 4.621 AVERAGE NO. OF CYCLES SM | FLIGHTS = 4.621 AVERAGE NO. OF CYCLES SM |
| | 2,500 85,331 4,000 | = 2,500 = 85,331 = 4,000 = 19,353 |

| - 4 | 2,500 | FLIGHTS = 4.621 | LANDINGS = | 4,621 |
|------|--------|----------------------------|-----------------------|---------|
| - 11 | 85,331 | AVERAGE NO. OF CYCLES PER: | FLIGHT = | 18.5 |
| | 4,000 | | FLIGHT HOUR = | 34.1 |
| | 19,353 | SMALLES | ALLEST VALLEY (PSI) = | -24,298 |

AVERAGE NO. OF CYCLES PER: FLIGHT = 22.0
FLIGHT HOUR = 11.0
SMALLEST VALLEY (PSI) = -24,298

TABLE B-26 SPECTRUM BS1A.FL2 (NO. 26)

DESCRIPTION: FLIGHT 1A - 2.0 HOUR DURATION

| | (ps1) | PEAK DISTRIBUTION | NOITUS | RANGE DISTRIBUTION | NOTION | R DIS | DISTRIBUTION |
|--|--|-------------------|--------|--------------------|--------|-------|--------------|
| 1,000 | 1,000 1,00 | 1 | c | | - | æ | c |
| 1,000 2,000 2,000 2,000 3,000 2,000 3,000 2,000 3,000 | 1,000 | | | | | | |
| 1,000 | 1,000 1,00 | | | | | - | 1,124 |
| 1,000 | 1,000 1,00 | -12,000 | | | | 200 | 212 |
| 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,200 1,000 1,200 1,000 1,200 1,000 1,200 1,000 1,200 1,000 1,200 1,000 1,200 1,000 | 1,000 1,000 2,000 3,000 4,000 8,627 1,000 1,000 1,207 1,000 1,000 1,207 1,000 1,000 1,207 1,000 1, | 0000'11- | | | | 7.1- | 4 |
| 2,000 4,000 6,648 6,000 6,677 6,000 6,677 1,000 1, | 2,000 4,000 6,646 6,269 6,269 6,000 6,677 7,000 7,265 10,000 7,265 11,000 7,265 11,000 7,265 11,000 7,265 12,000 7,265 13,000 7,266 7,27 | -10,000 | | 0000 | | 0 | , |
| 1,246 2,000 2,600 2,00 | 100 | 000 6- | | 2,000 | | 0 - | 0: |
| 1000 | 1000 | 000 | | 000 | | | C |
| 4,000 8,687 6,489 6,000 8,627 6,294 7,000 8,627 6,100 6,677 1,19 8,000 3,850 1,100 7,7 1,100 7,7 1,100 7,7 1,246 13,000 8 2,335 1,000 8 1,246 1,000 8 1,246 1,000 8 2,335 1,000 6 1,246 2,000 9 1,246 2,000 9 1,246 2,000 9 1,246 2,000 9 1,246 2,000 9 1,246 2,000 9 2,340 2,000 9 2,340 2,000 9 2,340 2,000 9 3,000 2,000 3 3,000 3,000 3 3,000 | 4,000 8,687 4,254 6,000 6,687 6,000 6,677 1,000 6,677 1,000 6,677 1,000 6,677 1,000 7,7 1,000 7,7 1,000 7,7 1,000 7,7 1,000 7,4 0 13,000 15,000 6 16,000 6 17,000 6 18,000 6 18,000 6 18,000 6 18,000 6 18,000 6 18,000 6 18,000 6 2,000 2,000 2,000 2,000 2,0 | -8,000 | | 3,000 | e | 0. | 0 |
| 4,254 5,000 6,677 -,5 6,48 7,000 6,677 -,3 6,180 6,27 -,3 7,000 6,27 -,3 1,000 7,27 -,3 1,0 | 1000 | -7,000 | 1 | 4,000 | .0.0 | 7 | 20 |
| 4,254 4,254 4,254 4,254 4,254 4,254 4,254 4,254 6,100 6,4279 5 5 4 5 <td>4,254 4,627 4,254 5,000 6,427 6,100 6,427 </td> <td>000 9-</td> <td>0</td> <td>5 000</td> <td>2,601</td> <td>- 6</td> <td>77</td> | 4,254 4,627 4,254 5,000 6,427 6,100 6,427 | 000 9- | 0 | 5 000 | 2,601 | - 6 | 77 |
| 1,000 6,679 1,000 6,679 1,000 6,679 1,000 6,675 1,000 1,2079 1,000 1,2079 1,000 1,2079 1,000 1,2079 1,000 1,2079 1,000 1,2079 1,000 1,2079 1,000 | 1000 | 000 | 4,254 | 000 | 4,621 | , 4 | 0 |
| 7,000 | 1,000 2,000 1,00 | 000,0- | 648 | 00000 | 6 879 | | 3.8 |
| 1000 3,650 1.2 1 | 1000 3,650 -1.3 -1.3 -1.5 | -4,000 | 000 | 7,000 | 0// | 4 | 202 |
| 1,19 9,000 3,850 -1,1 | 1/9 9,000 3,850 -1,1 1,000 1,209 -1,1 1,000 1,209 -1,1 1,000 1,209 -1,1 1,000 1,209 -1,1 1,000 -1,2 -1,1 1,000 -1,2 -1,1 1,000 -1,2 -1,1 1,000 -1,2 -1,1 1,000 -1,2 -1,1 1,000 -1,2 -1,1 | -3.000 | 10219 | 8.000 | 2.0 | - 3 | 5 |
| 1,000 | 1,000 | 0000 | 611 | 000 | 3,850 | | 0 |
| 1,000 2/4 -1 1,000 -2/4 -1 1,000 -2/4 -1 -1 -1 -1 -1 -1 -1 - | 1,000 2/4 0 1 0 0 0 0 0 0 0 0 | 000,2- | 20 | 000.6 | 1.209 | 7:- | 56 |
| 1,000 | 1,000 | 000. | < | 000,01 | 2/4 | -: | 74 |
| 12,000 7,6 13,000 13,000 | 12,000 76 13,000 76 13,000 76 14,000 76 15,000 76 | 0 | | 11,000 | 1 | 0 | 1001 |
| 13,000 16 17 17 17 17 17 17 17 | 13,000 14,000 15,000 16,000 1 | 1 000 | 0 | 12,000 | | - | 727 |
| 1,000 1,00 | 1,000 1,00 | 000 | 0 | 0000 | 00 | | 11 |
| 1,000 1,00 | 14,000 15,000 16,000 1 | 7,000 | 0 | 13,000 | 1/6 | 7: | 430 |
| 5 000 | 15,000 | 3,000 | | 14,000 | | | 101 |
| 100 | 1000 | 000 | 2 | 15,000 | 0 | 4 | 1717 |
| 1,000 8 1,000 8 1,000 8 1,000 8 1,000 8 1,000 8 1,000 8 1,000 8 1,000 8 1,000 8 1,000 8 1,000 8 1,000 8 1,000 8 1,000 8 1,000 | 1,000 8 | 000 | 0 | 000 | 14 | | 5,097 |
| 1,000 0 0 0 0 0 0 0 0 0 | 17,000 . | 2,000 | 545 | 000,00 | 00 | 6. | 7. 535 |
| 18,000 6 18 18 18 18 18 18 18 | | 0000,9 | 20 | 17,000 | | 9. | 200 |
| 1,246 19,000 6 8 8 9 9 9 9 9 9 9 9 | 1.00 2.40 | 7.000 | 1 | 18,000 | 2 | 1 | 47 |
| 3,900 2,000 0 0 0 0 0 0 0 0 0 | 100 0 0 0 0 0 0 0 0 | 000 | 1,266 | 000 | 9 | 0 | 0 |
| 5,335 21,000 5 1.0 2,042 22,000 94 2,146 24,000 7.95 35 26,000 94 35 26,000 94 35 26,000 94 37 28,000 97 38,000 97 39,000 39,000 39,000 31,000 31,000 31,000 32,000 33,000 35,000 33,000 35,000 35,000 35,000 35,000 35,000 35,000 35,000 35,000 35,000 35,000 35,000 35,000 35,000 35,000 35,000 35 | 5,335 21,000 5 1.0 2,027 22,000 94 2,100 795 2,100 795 2,100 795 2,100 795 3,100 3,100 3,100 3,100 3,100 3,100 3,100 3 | 0000 | 3,900 | 000.61 | 0 | | 0 |
| 3,027 22,000 9,4 1,346 23,000 9,4 1,514 25,000 9,4 1,514 25,000 9,4 1,514 25,000 9,4 1,514 25,000 9,4 1,514 25,000 9,4 1,514 25,000 9,4 1,514 25,000 9,4 1,514 25,000 9,4 1,514 25,000 9,4 1,514 25,000 9,4 1,514 2,514 3,400 1,514 3,400 9,4 1,514 3,400 | 3/027 21,000 9/4 1,346 23,000 9/4 1,346 23,000 9/4 1,346 24,000 7/95 1,000 | 000.6 | 5,335 | 20,000 | 6 | r | C |
| 1,346 22,000 34,000 35,000 35,000 36 | 25,000 | 10.000 | 2002 | 21,000 | | 0.1 | 11 >00 |
| 7, 346 7, 346 7, 346 7, 346 7, 347 8, 25, 000 7, 26, 000 7, 26, 000 7, 26, 000 7, 26, 000 7, 26, 000 7, 26, 000 8, 000 7, 28, 000 8, 000 9, 000 13, 000 13, 000 13, 000 13, 000 13, 000 14, 000 15, 000 16, 000 17, 000 18, 000 18, 000 18, 000 19, 0 | 7, 346 8, 7, 946 18, 7, 946 18, 7, 946 18, 7, 946 18, 7, 946 19, 900 19, 900 | 11 000 | 2,061 | 22,000 | | | 067/11 |
| 25.9 26.000 35.000 27.000 | 25/9 24,000 18/ 25,000 35 26,000 1 35 26,000 1 23,000 2 30,000 2 30,000 3 3,000 3 3,000 3 3,000 3 3,000 3 3,000 3 3,000 3 3,000 3 3,000 3 3,000 | 000 | 1,346 | 000 | 76 | | |
| 24,000 35 6 25,000 7 28,000 7 28,000 7 28,000 7 28,000 8 37,000 8 37,000 9 37 | 24,000 35 25,000 6 8 22,000 7 28,000 7 28,000 7 29,000 8 30,000 8 31,000 8 32,000 8 33,000 8 34,000 | 12,000 | 519 | 23,000 | 795 | | |
| 25,000 35,000 3,000 31,000 33,000 33,000 33,000 33,000 | 25,000 35,000 7,000 7,000 7,000 7,000 83,000 84,000 85,000 85,000 | 13,000 | 181 | 24,000 | 257 | | |
| 26,000 27,000 28,000 30,000 31,000 33,000 34,000 35,000 35,000 36,000 37,000 38,000 37,000 38,000 | 26,000 3 28,000 3 31,000 3 31,000 3 31,000 3 31,000 3 31,000 3 31,000 3 31,000 3 31,000 3 31,000 3 31,000 | 14,000 | 36 | 25,000 | 100 | | |
| 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 3 2 27,000 29,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 | 15,000 | 33 | 26,000 | 11 | | |
| 3 28,000 6 30,000 8 32,000 33,000 34,000 35,000 35,000 | 3,000 31,000 31,000 32,000 33,000 34,000 35,000 | 000 | 80 | 22 000 | 89 | | |
| 28,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 | 28,000 31,000 31,000 32,000 34,000 35,000 | 000,01 | m | 000,12 | 4 | | |
| 29,000 31,000 32,000 33,000 34,000 35,000 | 29,000 31,000 31,000 32,000 34,000 35,000 | 000,/1 | - | 78,000 | 0 | | |
| 30,000 31,000 31,000 33,000 34,000 35,000 | 30,000 31,000 32,000 33,000 34,000 35,000 | 18,000 | | 29,000 | 3 | | |
| 33,000 | 31,000 | 19.000 | | 30.000 | , | | |
| | | 20 000 | | 31 000 | 0 | | |
| | | 000,00 | | 000 | | | |
| | | 71,000 | | 32,000 | | | |
| | | 22,000 | | 33,000 | | | |
| | | 23.000 | I | 34.000 | | | |
| | | 24 000 | | 25 000 | | | |
| 25,000 27,000 27,000 | 25,000 27,000 27,000 | 000,47 | | 22,000 | | | |
| 27,000 | 27,000 | 000,62 | | | | | |
| 27,000 | 27,000 | 26,000 | | | | | |
| | | 27,000 | | | | | |
| | | | | | | | _ |

| | (Ps1) | 0 1.707 1.707 1.609/1.700 | | c | ~ | c |
|--|--------|--|---|--------|-------|--------|
| 1,000 1,00 | 7,2 | 0.707. 707. 707. 707. 709. 716. | 1,000 2,000 3,000 4,000 5,000 | | | |
| 1,000 | 72 | 02.73 69.70 100 100 100 100 100 100 100 100 100 1 | 2,000 | | | |
| 1,000 | | 001.707 0013 0691 | 1,000 2,000 3,000 4,000 5,000 | | - 1.5 | 231 |
| 1,000 | | 00 0013 0013 0013 0013 0013 | 1,000 2,000 3,000 4,000 5,000 | | | 888 |
| 1,000 23,929 -1,000 2, | 7/2 | 00 073 073 073 069/ | 2,000 | | 2.1 | |
| 2,000 2,000 2,000 2,079 1,000 2, | | 07.707 | 3,000 | | 0 | |
| 1,000 23,929 -1,5 | | 07.707 | 3,000 | | 6 | a |
| 1,000 23,929 7 6 | 122 | 0 1.707 1.707 1.697/ 2 2 2 2 2 | 5,000 | - | 8 | 000 |
| 100 | | 07.707 (07.3 (63/ 1/6 | 2,000 | 0 | 7 | , |
| 1,5,707 1,000 24,965 1,5,707 1,000 24,965 1,000 24,965 1,000 24,965 1,000 24,965 1,000 2,000 1,0 | | 107.707 107.3 169/ 16 | 000.9 | 23,929 | 4 | 901 |
| 1,000 24/965 -1.5 | | ,707 ,013 ,69/ ,16 | 000.9 | 9.899 | , | 0 |
| 1,000 1,576 1,000 1,00 | | 69/2 | 22262 | 370 PC | 0:- | /39 |
| 1, | 7 | 1693 | 7,000 | 201127 | 4 | 100 |
| 1,5/6 1,5/ | | 1/6 | 8,000 | 14,637 | - 3 | 117 |
| 1,000 3.50 1.00 3.50 1.00 3.50 1.00 3.50 1.00 3.50 1.00 3.50 | | 200 | 000 | 1,516 | | 0 |
| 10,000 35 10,000 12,00 | H | 2 | 000.6 | 390 | 7:- | 06/ |
| 1,000 1,00 | 000.1 | 1 | 10,000 | 35 | -: | // |
| 12,000 7.05 1.00 7.05 1.00 1.00 7.05 1.00 | 1.000 | | 11,000 | 100 | 0 | 3/16 |
| 13,000 14,000 17,000 1 | 0000 | 0 | 12,000 | 103 | | 343 |
| 1,000 61 3,000 61 3,000 61 3,000 61 3,000 61 3,000 61 3,000 61 3,000 61 3,000 61 3,000 | 0000 | 0 | 000,31 | 1 | | 24 |
| 14,000 | 2,000 | 0 | 13,000 | 19 | 7: | 788 |
| 15,000 57 14 15 16 16 16 16 16 16 16 | 3,000 | | 14,000 | | .3 | 000 |
| 16,000 26 17,000 2 17 | 4.000 | 2 | 15.000 | - | 4. | 200 |
| 1,000 26 1,000 26 1,000 26 1,000 26 1,000 27 1,000 27 1,000 27 1,000 27 1,000 27 1,000 27 1,000 27 1,000 27 1,000 27 2,000 2,0 | 2000 | 0 | 16,000 | 2/ | 2 | 0000 |
| 1,000 2/1 8 1 1 1 1 1 1 1 1 | 2 | | 000,01 | 28 | | 24,301 |
| 18,000 | - | | 000, | 0 | 0.1 | 857 |
| 19,000 | 7,000 | | 18,000 | 21 | -: | 0 |
| 1,0 26,000 28,1 1,0 4,1 2,0 | + | 0 | 19.000 | 17 | 8. | |
| 1.0 2.61 2.61 1.0 2.61 1.0 2.61 1.0 2.61 1.0 2.61 1.0 2.61 1.0 2.61 1.0 2.61 1.0 2.61 1.0 2.61 1.0 2.61 1.0 2.61 1.0 2.61 1.0 2.61 1.0 2.61 1.0 2.61 | - | 141 | 20 000 | 0 | 6 | 0 |
| 17,1/5 1 | - | 219 | 2000 | 281 | | 0 |
| 25,000 650 7,677 24,000 7,677 25,000 7,600 7,000 7,000 7,000 7,000 7,000 7,000 1 | | 511. | 000,12 | 3.023 | 2. | 41,589 |
| 23,000 (557) (57) (57) (57) (57) (57) (57) (57) (57) (57) (57) (57) (57) (57) (57) (57) (67) (7) (7) (8) (9) (9) (9) (9) (9) (9) (9) (9 | - | 307 | 22,000 | 1013 | | |
| 24,000 7/6 25,000 33 27,000 7/0 28,000 7/0 28,000 7/0 33,000 94,000 33,000 33,000 33,000 34,000 | + | 1/2 | 23,000 | 259 | | |
| 7/6 26,000 33 27,000 7/0 28,000 7/0 28,000 7/0 30,000 1 31,000 1 31,000 32,000 33,000 34,000 35,000 | 1 | 100 | 24.000 | | | |
| 7/6 26,000 33 28,000 10 31,000 10 32,000 10 33,000 10 34,000 10 34,000 10 35,000 10 35,000 | - | 200 | 25,000 | 67 | | |
| 23 27,000 28,000 28,000 7 30,000 7 31,000 82,000 34,000 35,000 35,000 | | 116 | 2000 96 | 7 | | |
| 27,000 28,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 | 000,61 | 33 | 000,02 | 3 | | |
| 28,000 29,000 7,000 31,000 32,000 34,000 35,000 | 16,000 | 0 | 27,000 | 6 | | |
| 29,000 1 30,000 22,000 33,000 34,000 35,000 | 17,000 | | 28,000 | 0 | | |
| 7 30,000 13,000 13,000 14,000 35,000 | 18,000 | | 29,000 | 0, | | |
| 31,000 | 19.000 | T | 30.000 | 2 | | |
| 0 | 000 00 | - | 21 000 | 0 | | |
| | 000,02 | 0 | 000,15 | | | |
| | 21,000 | | 32,000 | | | |
| | 22,000 | T | 33,000 | | | |
| | 23,000 | T | 34,000 | | | |
| | 24,000 | T | 35.000 | | | |
| 27,000 | 25 000 | | | | | |
| 27,000 | 2,000 | | | | | |
| 27,000 | 2000 | | | | | |
| | 27,000 | T | | | | |
| | - | 1 | | | | |
| | | | | | | |

TABLE B-27 SPECTRUM BSIA.FL3 (NO. 27)

DESCRIPTION: FLIGHT 1A -- 4.0 HOUR DURATION

| FLIGHT HOURS | н | 2,500 | FLIGHTS = 625 | - LANDINGS | 625 | |
|------------------------|----|--------|----------------------------|------------------------|---------|--|
| TOTAL CYCLES | 11 | 16,469 | AVERAGE NO. OF CYCLES PER: | FLIGHT = | 26.4 | |
| RANGE TRUNCATION (PSI) | н | 4.000 | | FLIGHT HOUR = | 9.9 | |
| HIGHEST PEAK (PSI) | to | 16.675 | SMALLES | MALLEST VALLEY (PSI) = | -24.298 | |

| T HOURS | н | 2,500 | FLIGHTS = 625 | - LANDINGS - | 625 | FLIGHT HOURS | н | 2,500 |
|------------------|----|--------|-----------------------------------|--------------------------------|---------|------------------------|----|--------|
| CYCLES | н | 16,469 | AVERAGE NO. OF CYCLES PER: FLIGHT | FLIGHT = | 26.4 | TOTAL CYCLES | 11 | 68,368 |
| TRUNCATION (PSI) | | 4.000 | | FLIGHT HOUR = | 9.9 | RANGE TRUNCATION (PSI) | | 4.000 |
| ST PEAK (PSI) | ti | 16,675 | SMALLES | MALLEST VALLEY (PSI) = -24,298 | -24,298 | HIGHEST PEAK (PSI) | 11 | 23,603 |
| | | | | | | | | |

FLIGHTS = 4.132

AVERAGE NO. OF CYCLES PER: FLIGHT = 16.6

FLIGHT HOUR = 27.3

SMALLEST VALLEY (FSI) = -10.959

TABLE B-28 SPECTRUM BS1B.FLI (NO. 28)

DESCRIPTION: FLIGHT 1B - 0.605 HOUR DURATION

| c | | | | 0 | 202 | 634 | 2,265 | 0.1 |
|-------------|--|-----|---------|---------|---------|-----------------|-----------------|-------------------|
| ~ | | 0.0 | 2.1- | - | | 0. | | 0,- |
| c | | | | | | 0 | 44,882 | 0000 |
| Range (psi) | | | 000 | 2,000 | 3,000 | 000 | 2000 | 2000 |
| H | | | | | | | | • |
| = | | | | | | | | |
| | | | (pst) n | (psi) n | n (jsd) | (pst) n R n 1.5 | (pst) n R n 1.5 | (pst) n R n n 000 |

| PEAK DISTRIBUTION | BUTION | RANGE DISTRIBUTION | BUTION | R DIST | DISTRIBUTION |
|-------------------|--------|--------------------|--------|--------|--------------|
| Peak (psi) | c | Range (psi) | - | œ | c |
| -12,000 | | | | -15 | |
| -11,000 | | | | | |
| -10,000 | | 1,000 | I | -1.0 | ľ |
| -0000.6- | | 2,000 | | 6 | 200 |
| -8,000 | | 3,000 | 0 | 8. | 434 |
| 000. | | 000.4 | 44 882 | 1:- | 2.26 |
| 000 | 0 | 000.5 | 3,987 | 9. | 738 |
| 000 | 3,992 | 2,000 | 11,875 | ç:- | 289 |
| 000 | 840 | 000 | 2,584 | 4: | 4 |
| 2000 | 26 | 000 | 469 | | 0 |
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| 000 | * | 2000 | 25 | 0. | 12 |
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| 2,000 | | 2000 | /3 | ,, | 12 |
| 2000 | | 000 | , | | 303 |
| 000 | | 200,01 | 0 | 4. | 1, 532 |
| 000 | | 0000 | , | 0. | 13,068 |
| 000 | • | 000,01 | 54 | ۰۰ | 40,925 |
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| 000,000 | 0/ | 000,61 | 588 | 00.0 | 0 |
| 000,60 | 0 | 000,02 | 797 | 5. | 0 |
| 000,01 | 14 | 21,000 | 1931 | 1.0 | 1859 |
| 000. | 256 | 22,000 | 4.79 | | |
| 000,71 | 15.067 | 23,000 | 528 | | |
| 3,000 | 32.730 | 24,000 | 83 | | |
| 14,000 | 9.958 | 25,000 | a, | | |
| 15,000 | 367 8 | 26,000 | 7 | | |
| 16,000 | 1300 | 27,000 | - | | |
| 17,000 | 1001 | 28,000 | | | |
| 18,000 | 777 | 29,000 | - (| | |
| 19,000 | 26 | 30,000 | | | |
| 20,000 | 000 | 31,000 | | | |
| 21,000 | - 0 | 32,000 | | | |
| 22,000 | 0 | 33,000 | | | |
| 23,000 | | 34.000 | | | |
| 24,000 | | 35 000 | | | |
| 25,000 | 0 | 20000 | | | |
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| 1,000 1,000 1,000 1,000 1,0 | | DISTRIBUTION | KANGE DISTRIBUTION | NOTION | K DISI | SIKIBUIION |
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| 2,000 2, | 986,01- | - | 1,000 | | -1.0 | , , , |
| 1,000 1,475 1,000 1,46 | -9,000 | - | 2,000 | | 6 | 24 |
| 1000 1/3/2 | -8,000 | | 3,000 | | 8 | 0 |
| 1000 | -7.000 | 0 | 4.000 | | - 7 - | 0 |
| 1000 | 9- | 0 | 2,000 | 5,315 | 9 | H |
| 1000 1/1/2 | 000 | 2,123 | 000 | 2,905 | , 4 | 4 |
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| 13,000 31 14,000 5 15,000 16,000 17,000 1 | 1.000 | | 12,000 | *** | - | (88 |
| 1,000 1 | 2 000 | | 13 000 | 0 | | 242 |
| 1,000 1,00 | 0000 | | 2000 | 31 | 4. | 683 |
| 1,1000 1 1,000 1 1,000 1 1,000 1 1,000 1 1,000 1 1,000 1 1,000 1 1,000 1 1,000 | 3,000 | , | 14,000 | 3 | .3 | 2.066 |
| 1,1000 4 1,5 | 4,000 | , | 15,000 | - | 4. | 0,0 |
| 1,100 1,10 | 5.000 |) | 16.000 | | 5 | 0,000 |
| 1,150 1,15 | 000 | 242 | 17 000 | 7 | | 3,021 |
| 1,110 2,11 2,10 | | 314 | 000 | O | , r | 117 |
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| 1,000 2,00 | 1 | 0 | 21.000 | 2 | 1.0 | 0 |
| 23 66 5 23 000 163 7 000 163 7 000 163 7 000 163 7 000 163 7 000 164 7 000 175 7 | 1 | 101 | 22 000 | 3 | | 2 + |
| 23.6 163 163 163 163 163 163 163 16 | 000 | 805 | 000,23 | 7 | | |
| 24,000 27,000 27,000 28,000 1,000 | 000,21 | 238 | 23,000 | 0 | | |
| 25,000 27,000 28,000 30,000 31,000 | 13,000 | 103 | 24,000 | 75 | | |
| 28,000 1 28,000 28,000 28,000 31,000 33,000 34,000 35,000 35,000 37,000 38,0 | 14,000 | 1 | 25,000 | 30 | | |
| 27,000 28,000 38,000 38,000 38,000 38,000 38,000 38,000 | 15.000 | 7 | 26.000 | ,,,,, | | |
| 28,000 28,000 39,000 33,000 34,000 35,000 | 16,000 | , | 27,000 | 223 | | |
| 32,000 | 17,000 | - | 20000 | 123 | | |
| 33,000 | 000 | 2 | 2000 | 35 | | |
| 33,000 33,000 33,000 34,000 34,000 | 000,000 | | 000,62 | 9 | | |
| 31,000 33,000 34,000 35,000 | 000,61 | | 30,000 | 7 | | |
| 35,000 34,000 35,000 | 20,000 | | 31,000 | C | | |
| | 21,000 | | 32,000 | | | |
| | 22,000 | | 33,000 | | | |
| | 22,000 | | 34 000 | | | |
| | 2000 | | 000 | | | |
| 25,000 27,000 27,000 | 74,000 | | 35,000 | | | |
| 27,000 | 25,000 | | | | | |
| 27,000 | 26,000 | I | | | | |
| | 27,000 | I | | | | |
| | + | I | | | | |
| | | | | | | |

TABLE B-29 SPECTRUM BS1B.FL2 (NO. 29)

DESCRIPTION: FLIGHT 1B - 2.0 HOUR DURATION

| FLIGHT HOURS = | 2,500 | FLIGHTS = 1,250 | LANDINGS | н | 1,250 | FLIGHT HOURS | н | 2.500 |
|--------------------------|--------|----------------------------|---------------------|-----|---------|------------------------|----|--------|
| TOTAL CYCLES | 27,275 | AVERAGE NO. OF CYCLES PER: | FLIGHT | н | 21.8 | TOTAL CYCLES | н | 18,245 |
| RANGE TRUNCATION (PSI) = | 4,000 | | FLIGHT HOUR | = 2 | 10.9 | RANGE TRUNCATION (PSI) | 11 | 4,000 |
| HIGHEST PEAK (PSI) = | 25,617 | SMALLES | MALLEST VALLEY (PSI | = (| -13,811 | HIGHEST PEAK (PSI) | н | 24,478 |

FLIGHTS = 625

AVERAGE NO. OF CYCLES PER: FLIGHT = 29.2

FLIGHT HOUR = 7.3

SMALLEST VALLEY (PSI) = -16.534

TABLE B-30 SPECTRUM BS1B.FL3 (NO. 30)

DESCRIPTION: FLIGHT 1B - 4.0 HOUR DURATION

| 1,000 | -(2,000 -(2,000 -1,000 -1,000 -2,000 -7,000 -7,000 -7,000 | | | | | |
|--|---|-------|--------|-------|------|--------|
| 1,000 1,00 | -12, 484 -14, 1000 -2, 1000 -7, 1000 -7, 1000 -6, 1000 | c | | u | œ | u |
| 1,000 1,00 | 12, 000 11, 1000 11, 1000 1000 | | | | | |
| 1,000 1,00 | 10.000 -9.000 -8.000 -7.000 | | | | -1.5 | |
| 1,000 | -10,000 -7,000 -6,000 | I | | T | -1.2 | 14.0 |
| 1,000 1,00 | -7.000 -7.000 | | 1.000 | | -1.0 | 9/9 |
| 100 | -7,000 -7,000 -6,000 | | 2 000 | | 0 | 231 |
| 1000 | -7,000 | 2/ | 000 | | | 34 |
| 1,236 5,000 1,566 5 1,686 8,000 3,350 5 1,686 8,000 1,685 3 1,000 2,27 - | 000,9 | 0 | 000.5 | 0 | 2 1 | 241 |
| 1,236 5,000 3,350 -2,5 | 000.9- | 0 | 000,4 | 15661 | 1 | 59 |
| 1,000 5,057 5 1,000 2,057 5 1,00 | | , 230 | 2,000 | 2 360 | 9:- | 2 |
| 1 | -5.000 | 1,630 | 000.9 | 0,000 | 5 | 0 |
| 1,086 1,095 1,09 | 4 000 | 11 | 2,000 | 5,057 | - 4 | - |
| 1,000 267 -1 -1 -1 -1 -1 -1 -1 - | 000 | 168 | 000 | 1,085 | | 2 |
| 1,000 2c7 1,000 2 2 2 2 2 2 2 2 2 | 2000 | 4 | 00000 | 482 | 2.0 | 4 |
| 10,000 | -2,000 | C | 000.6 | 207 | 7:- | 0/ |
| 1,000 39 1 1 1 1 1 1 1 1 | -1,000 | | 10,000 | 200 | - | 23 |
| 12,000 | 0 | | 11.000 | 25 | 0 | 62 |
| 13,000 | 000 | | 12,000 | 24 | | 12 |
| 1,000 | 000 | | 000,31 | 48 | | 49 |
| 14,000 | 7,000 | | 3,000 | 22 | 7. | 121 |
| 15,000 6 6 6 6 6 6 6 6 6 | 3.000 | | 14,000 | 3 | .3 | 100 |
| 1,000 6 | 000 | | 15,000 | 00 | - P | 446 |
| 17,000 | 000 | | 000 | ' | | 1,624 |
| 1,000 | 000,0 | | 000,01 | 90 | 0. | 8,146 |
| 18,000 2 3 3 3 3 3 3 3 3 3 | 0000 | , | 000,71 | 4 | 9. | 619 61 |
| 1000 | 2,000 | < | 18,000 | | 1. | 11.171 |
| 3 20,000 209 1.0 | 8,000 | 2 | 19.000 | 2 | 8 | 11.11 |
| 1.0 | 000 | 2 | 20 000 | 0 | 0 | 0 |
| 2,002 2,002 2,002 2,002 2,002 2,002 2,002 2,000 2,100 2, | 000,6 | 9 | 000,03 | 209 | | 0 |
| 3,0/2 22,000 74 9,642 23,000 6,37 9,642 24,000 255 6,746 26,000 7 71 30,000 7 71 30,000 0 72 31,000 0 73 31,000 0 74 34,000 0 75 35,000 0 76 34,000 0 77 36,000 0 78 36,000 0 79 31,000 0 70 34,000 0 70 3 | 986,01 | " | 000,12 | 80 | 0 | 1.517 |
| 23,000 (2,174 (2,174 (2,174 (2,174 (2,000 (3,174 (2,000 (3,174 (3,000 (3,000 (3,174 (3,000 | 000,11 | 2010 | 22,000 | 17/ | | |
| 8,4642 8,343 2,744 2,000 1,4449 1,4449 1,000 1,1449 1,000 1,100 1,000 | 12.000 | 3/0/2 | 23.000 | | | |
| 25.000 1,447 1,447 1,447 1,447 1,447 1,447 1,000 1,447 1,000 1,147 1,000 1,147 1,000 1,147 1,000 1,147 1,000 1 | 13,000 | 2,642 | 24 000 | 637 | | |
| 2,746 1,449 1,449 2,000 2,000 74 28,000 74 29,000 74 29,000 74 20, | 2,000 | 8,363 | 000,12 | 256 | | |
| 26,000 307 74 29,000 74 29,000 75 76 77 77 78,000 78 79 79 70 70 70 70 70 70 70 70 70 70 | 14,000 | 2746 | 72,000 | 45 | | |
| 74 23,000 25 31,000 25 32,000 25 32,000 25 32,000 25 32,000 25 32,000 25 32,000 25 32,000 25 35,000 25 25 35,000 25 25 25 25 25 25 25 25 25 25 25 25 25 | 15,000 | 077 | 26,000 | - | | |
| 367 74 74 74 74 75 76 76 76 77 76 76 76 76 76 76 | 16,000 | 1,447 | 27,000 | - | | |
| 74 29,000 25 32 30,000 25 32,000 4 34,000 7 34,000 7 34,000 7 34,000 7 34,000 7 34,000 | 17,000 | 307 | 000 | 3 | | |
| 71 30,000 31,000 4 4 33,000 7 34,000 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 | 000,71 | 74 | 000,03 | - | | |
| 32 30,000 52 31,000 52 33,000 7 33,000 7 33,000 7 33,000 7 34,000 7 32,000 7 33,000 7 33,000 7 34,000 | 18,000 | 71 | 29,000 | C | | |
| 222 | 19.000 | | 30,000 | | | |
| 0 - 4 - 0 | 20 000 | 35 | 31 000 | | | |
| 04-0-0 | 000 | 25 | 000 | | | |
| 422-0 | 000,12 | 0 | 32,000 | | | |
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| 4 ~ 0 | 23 000 | | 34,000 | I | | |
| N-0 | 000 | + | 35 000 | | | |
| | 000,42 | 2 | 32,000 | | | |
| | 25,000 | | | | | |
| - | 26,000 | | | | | |
| | 27,000 | 2 | | | | |
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| | | | | | | |

| Peak (ps1) | PEAK DISTRIBUTION | BUTION | RANGE DISTRIBUTION | UTION | R DIST | DISTRIBUTION |
|--|-------------------|--------|--------------------|-------|--------|--------------|
| 1,000 2, | Peak (psi) | c | Range (psi) | | × | u |
| 1,000 2, | | | | | | |
| 1,000 2, | | | | | | |
| 1,000 2, | 200 | | | | 2 | 0 |
| 1,000 2, | 200 | | | | 7.1- | 0 |
| 2000 | B 100 | | 000,1 | | 0.1- | 10 |
| 1000 | 886.6- | - | 2.000 | | 6 | 0 |
| 25 | -8.000 | | 3,000 | | 0 | |
| 1000 | 000 | C | 000 | 0 | | 141 |
| 1000 | 0001 | , J | 000, | | 1:- | 6 |
| 6,000 6,000 7,000 11,000 12,000 12,000 14,000 15,000 16,000 17,000 18,000 18,000 18,000 18,000 19,000 19,000 10,000 1 | -6,000 | 76 | 2,000 | | 9:- | |
| 2000 | -5.000 | 2 (| 0000.9 | | 5 | |
| 1000 | A 000 | 0 | 7 000 | 1 767 | V - | 0 |
| 10000 100000 100 | 000 | 36 | 000 | 600 | | 0 |
| 1000 | -3,000 | ď | 8,000 | Ti ti | 2:- | C |
| 10,000 11,000 12,000 13,000 14,000 15,000 16,000 17,000 18,000 18,000 19 | -2,000 | | 000.6 | | 2 |) |
| 1,000 2,000 1,00 | -1.000 |) | 10.000 | 100 | | 7 |
| 12,000 13,000 15,000 16,000 16,000 17,000 18,000 19,000 | | < | 000 | 200 | | ~> |
| 12,000 14,000 15,000 17,000 17,000 17,000 17,000 18,000 18,000 19,000 | | | 000 | 42 | 0 | 0 |
| 13,000 | 000, | - | 12,000 | | - | 23 |
| 14,000 15,000 17,000 17,000 17,000 17,000 17,000 17,000 17,000 17,000 17,000 17,000 17,000 17,000 18,000 1 | 2.000 | | 13.000 | 9/ | 2 | 27 |
| 15,000 16,000 17,000 18,000 19,000 1 | 0000 | | 000 | 0/ | | 3 |
| 15,000 | 3,000 | | 000,4 | L | 2. | 2:2 |
| 16,000 | 4,000 | | 15,000 | , | 4. | (11) |
| 17,000 18,000 19,000 1 | 5.000 | | 16.000 | 0 | 5 | |
| 18,000 19,000 1 | 000 | | 2006 | 1 | | 0 CT |
| 18,000 20,000 21,000 21,000 21,000 22,000 22,000 24,000 26,000 26,000 27,000 28,000 | 000,0 | | 000,71 | 1 | 0.1 | 1.687 |
| 10,000 21,000 21,000 22,000 22,000 24,000 25,000 26,000 27,000 28,000 | 000, | 0 | 18,000 | 0 | 1. | 27.2 |
| 20,000 21,000 21,000 22,000 23,000 26,000 | 8,000 | | 19,000 | | 8. | |
| 21,000 2 + 62 2 23,000 2 + 63 2 24,000 2 5,000 2 5,000 2 6,000 2 7,000 2 7,000 2 7,000 2 7,000 2 8,000 2 1,000 2 7,000 2 1,000 2 2,000 2 3,000 2 3,000 2 3,000 2 4,000 2 5,000 2 5,000 2 7,000 2 8,000 2 1,000 2 1, | 000.6 | | 20.000 | | 6 | |
| 22,000 2,4,6,9 2,4,6,9 2,000 2,00 | 1000 | 0 | 21 000 | | | 0 |
| (2) (2) (2) (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4 | 000,11 | 0 | 000,13 | | 0 | 750 |
| 23,000 2,4,63 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 3,000 4,300 3,000 4,300 4,000 | 000,1 | 10 | 22,000 | , | | |
| 24,000 25,463 25,000 25,000 25,000 25,000 25,000 27,000 29,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 | 12.000 | 1001 | 23.000 | | | - |
| 2000 | 12 000 | | 24 000 | 0 | | |
| 1000 | 000 | 2,403 | 000 | 201 | | |
| | 14,000 | 4.426 | 72,000 | Lo. | | |
| 27,000 25,000 28,000 29,000 43 31,000 53 33,000 33,000 34,000 50 50 50 50 50 50 50 50 50 | 15,000 | 9000 | 26,000 | | | |
| 28,000 25,000 29,000 43,000 31,000 32,000 33,000 34,000 35,000 | 16.000 | 6,000 | 27,000 | | | |
| 29,000 29,000 30,000 31,000 32,000 34,000 35,000 | 17 000 | 920 | 28 000 | | | |
| (# 1) 000 | 000 | C.1 | 2000 | -+ | | |
| 33,000 33,000 34,000 35,000 35,000 | 18,000 | 10 | 29,000 | 03 | | |
| 31,000 7 33,000 7 33,000 8 34,000 9 35,000 | 19,000 | 43 | 30,000 | 0.0 | | |
| 32,000 33,000 34,000 35,000 | 20.000 | , | 31.000 | 1 | | |
| 33,000 | 21 000 | () | 32 000 | | | |
| 35,000 | 000 | 14 | 000 | _ | | |
| n - 0 | 000,22 | 4 | 33,000 | 0 | | |
| -0 | 23,000 | ~ | 34,000 | | | |
| | 24.000 | | 35.000 | | | |
| | 25,000 | - | | | | |
| 27,000 | 26,000 | 0 | | | | |
| | 200,10 | | | | | |
| | 000'.7 | | | | | |
| | | | | | | |
| | | | | | | |

TABLE B-31 SPECTRUM BS6.FS1 (NO. 31)

AVERAGE NO. OF CYCLES PER: FLIGHT = 74.7

FLIGHT HOUR = 72.3

SMALLEST VALLEY (PSI) = -17.878 DESCRIPTION: SPECTRUM NO. 6 WITHOUT LANDING IMPACT CYCLES

TABLE B-32 SPECTRUM BS6.FS2 (NO. 32)

DESCRIPTION: SPECTRUM NO. 6 WITH SIMPLIFIED FLAPS-UP CLIMB AND DESCENT GUST SEGMENTS

FLIGHT HOURS = 2,300 TOTAL CYCLES = 180,493 RANGE TRUNCATION (PSI) = 4,000

LANDINGS = 3,843
:LES PER: FLIGHT = 74.5
FLIGHT HOUR = 72.2
SMALLEST VALLEY (PSI) = -24,298 FLIGHTS = 2,422 LANDINGS AVERAGE NO. OF CYCLES PER: FLIGHT

16,400 52,076 88,604 870 0 0 DISTRIBUTION ~ 74,280 66,210 24,428 7,336 1,063 1,063 2,339 1,063 1,063 RANGE DISTRIBUTION Range (psi) 1,000 4,000 4,000 7,000 7,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 12,000 13,000 14,000 16,000 17,000 18, 000000 209 1,382 3,073 7,027 7507 737 PEAK DISTRIBUTION Peak (psi) 1.000 1.

| | | _ | _ | | _ | _ | _ | _ | _ | _ | _ | _ | | _ | _ | _ | _ | _ | | _ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------|-------------|---|---------|---------|--------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|------------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|---|
| DISTRIBUTION | c | | 161 | 635 | 248 | 848 | 476 | 229 | 274 | 06/ | 75 | 0 | | - 6 | 3 | 2: | 4/ | 24/ | 619 | 3,112 | 16,318 | 52,467 | 69, 957 | 828 | 0 | 0 | 13.450 | | | | | | | | | | | | | | | | | | | | |
| R DIST | æ | | 5 1- | 2 | 7. | 0.1 | 2. | 0,1 | 1: | 9. | 5 | 4 | 3 | 2 | - | 0 | - | 2 | , . | ? • | . . | | 0.1 | - | , o | 6. | 0.1 | | | | | | | | | | | | | | | | | | | | |
| UTION | - | | | | | | | | 74,84c | 66,176 | 24.483 | 7.846 | 2 333 | 1,000 | 200 | 200 | 24 | 63 | 9 | 4 | 0 | 0 | 24 | 96 | 121 | 4:4 | 1,133 | 927 | 389 | 011 | 391 | 26 | 159 | 25 | 7 | 0 | | 0 | | | | | | I | I | T | - |
| RANGE DISTRIBUTION | Range (psi) | | | | 1 000 | 000. | 000,7 | 3,000 | 000,4 | 000.6 | 000,0 | 000, | 8,000 | 000.6 | 10,000 | 11,000 | 12,000 | 13,000 | 14 000 | 000 | 000,51 | 2000 | 000,01 | 000,81 | 000,61 | 20,000 | 21,000 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 | 78,000 | 000,62 | 30,000 | 31,000 | 32,000 | 33,000 | 34,000 | 35.000 | 1 | | 1 | | 1 | - |
| BUTION | c | | | | 0 | " | a | 208 | 806 | 1,351 | 3.112 | 7.027 | 734 | 16 | | 3 | 0 | | | | • | 0 | m | 233 | 4,226 | 17,152 | 34,417 | 31,849 | 36,116 | 9,000 | 26,320 | 6,039 | 1,567 | 186 | 197 | 63 | 9/ | 7 | 7 | | | | | | | T | |
| PEAK DISTRIBUTION | Peak (psi) | | -12 000 | -11,000 | 10,000 | 000 | 000.6- | 000,00 | 000 | 000,9- | 000.6- | -4,000 | -3,000 | -2,000 | -1,000 | 0 | 1,000 | 2.000 | 3.000 | 000 | 000 | 000 | 000.2 | 000. | 000.8 | 000,6 | 000,01 | 000,11 | 000,21 | 13,000 | 14,000 | 000.51 | 000,91 | 000,71 | 000.81 | 000,61 | 20,000 | 000,12 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 | 1 | 1 | |

TABLE B-33 SPECTRUM BSI.FS3 (NO. 33)

DESCRIPTION: SPECTRUM NO. I WITH SIMPLIFIED FLAPS-UP CLIMB AND DESCENT GUST SEGMENTS

| FLIGHT HOURS | н | 2,500 | FLIGHTS = 2,528 | LANDINGS | = 2,528 |
|--------------------------|----|--------|----------------------------|---------------------------------|----------|
| TOTAL CYCLES | н | 39.832 | AVERAGE NO. OF CYCLES PER: | FLIGHT | = 15.8 |
| RANGE TRUNCATION (PSI) = | я | 4,000 | | FLIGHT HOUR = | = 15.9 |
| HIGHEST PEAK (PSI) | 11 | 24,415 | SMALLES | SMALLEST VALLEY (PSI) = -24,298 | = -24,29 |

| 24,298 | | |
|-------------------------|--|--|
| SMALLEST VALLEY (PSI) = | | |
| 24.415 | | |
| 11 | | |
| ST PEAK (PSI) | | |

| FUNCTIONS SAME AS FOR CRUISE | CTION | SSAN | UNCTIONS SAME AS FOR CRUISE | RUISE | | | | |
|------------------------------|-------|------|-----------------------------|-----------------|----------------------------------|------------------------|---|---------|
| LIGHT HOURS | | 2,5 | 2,500 | FLIGHTS = 2,528 | .528 | LANDINGS | | 2.528 |
| OTAL CYCLES | • | 45 | 15,403 | AVERAGE NO. | VERAGE NO. OF CYCLES PER: FLIGHT | FLIGHT | | 18.0 |
| ANGE TRUNCATION (PSI) = | (PSI) | | 4.000 | | | FLIGHT HOUR : | = | 18.2 |
| IGHEST PEAK (PSI) | | 22 | 22,032 | | SMALLEST | MALLEST VALLEY (PSI) = | = | -24,298 |

TABLE B-34 SPECTRUM BSI.FS4 (NO. 34)

| c | | 11 | 1.085 | 12 | | 10 | 48 | 161 | 182 | 303 | 47 | | 25 | 0 | 48 | 4 | 16 | 36 | 158 | 765 | 1 344 | 4,044 | 14.11 | 4,688 | 1,208 | 0 | 0 | 99 | | - | | | | | _ | | | | | | _ | | | | | | |
|-------------|-------------------|---------------------|-----------------------|-------------------|---------------------|-------------------|-------------------|--|---|---|---|--|---|-------|---|---------------------|---|-----------------|-------------|-------------|-------------|-------------|-------------------------------|---------------------|---------------------|---|---|-------------------------------|---|---|---|--------------|---|---|--|--|---|--|---|--|--|--|--|--|--|--|--|
| × | | | 0.5 | -1.2 | -1.0 | 6 | 00 | 2. | 1:- | 0 | 5 | 4 | - 3 | 2.0 | 7:4 | - " | 0 | - | .2 | .3 | 4. | -5. | 9 | - | | 0.0 | 7. | 0 | | | | | | | | | | | | | | | | | | | |
| u | | | | | | | | 0 | 21.848 | 4042 | 10 000 | 10,750 | 2,642 | 1,407 | 322 | 43 | 25 | 3,0 | ā | | 2 4 | 2, | , | 0 | 61 | 199 | 101 | 298 | 1,372 | 469 | 77 | 11 | 0 | 2 | 0 | 6 | 4 | | | | | | | | | | |
| Range (psi) | | | | | 1,000 | 2.000 | 3,000 | 000 | 0000 | 2,000 | 000,9 | 7,000 | 8,000 | | 000.6 | 10,000 | 11,000 | 12,000 | 13,000 | 14,000 | 15,000 | 16,000 | 17,000 | 000 | 000,01 | 000 | 20,000 | 7,000 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 77,000 | 28,000 | 29,000 | 30,000 | 31.000 | 32,000 | 33 000 | 34 000 | 2000 | 22,000 | | | | |
| - | | | | | | | | | | C | 1010 | 2,101 | 6,366 | 0// | 8/ | 0 | | | | 0 | 0 | 0 | 477 | 0 | 0 | 525 | 7,452 | 1,683 | 790 | 6.332 | 11,042 | 2 408 | 1.530 | 215 | 122 | 100 | 27 | 1,1 | 9 | 0 | 2 | 0 | | | | | |
| Peak (psi) | | | -12,000 | -11,000 | -10,000 | -000-6- | 8 000 | 000,5 | 000.1- | -0000 | -2,000 | -4.000 | 3.000 | 000 | 000.7- | -1,000 | 0 | 1,000 | 2,000 — | 3,000 | 4.000 | 5.000 | 000 | 000 | 000 | 0000 | 000.6 | 10,889 | 11,000 | 12,000 | 13,000 | 14,000 | 15,000 | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 21,000 | 22 000 | 22,000 | 000,62 | 000,47 | 000,62 | 76,000 | 27,000 | |
| | n Range (psi) n R |) n Range (psi) n R |) n Range (psi) n R n | n Range (psi) n R |) n Range (psi) n R | n Range (psi) n R | n Range (ps1) n R |) n Range (psi) n R n n 1.5 1.00 1.000 1.000 2.0 | 1,000 -1.5 -1.5 -1.5 -1.0 -1.9 -1.9 -1.8 -1.8 | n Range (ps1) n R 1.5 1.5 1.00 1.000 1.000 1.00 1.00 1.00 | 7 Range (ps1) n R R 1.5 1.5 1.5 1.0 1.5 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 7 Range (ps1) n R R 1.5 1.00 1.00 1.00 1.00 1.00 1.00 1.00 | 7 Range (ps1) n R R 1.5 1.5 1.5 1.5 1.6 1.5 1.6 1.5 1.6 1.5 1.6 1.5 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 | 7 | 7 Range (ps1) n R R R R R R R R R R R R R R R R R R | 7 Range (ps1) n R R | 7 Range (ps1) n R R R R R R R R R R R R R R R R R R | n Range (ps1) | Nange (psi) | Nange (ps1) | Nange (ps1) | Nange (ps1) | Nange (ps1) N R R 1,000 | Nange (ps1) N R | Nange (ps1) N R R | Nange (ps1) Nange (ps1) | Nange (ps1) Nange (ps1) | Nange (ps1) N R 1,000 | Nange (ps1) Nange (ps1) | Nange (ps1) Nange (ps1) | Nange (ps1) Nange (ps1) | Namage (ps1) | Nange (ps1) Nange (ps1) | Nange (ps1) Nange (ps1) | Namage (ps1) Nama | Namage (ps1) Nama | Nange (ps1) Nange (ps1) | Namage (ps1) Nama | Namge (ps1) Namge (ps1) | Namage (ps1) Nama | Namage (ps1) Nama | Namage (ps1) Nama | Namage (ps1) Nama | Name (pst) Nam | Namage (ps1) Nama | Namage (ps1) Nama | Namage (ps1) Nama |

| Don't loci | 100 | KANGE DISTRIBUTION | NOTION | K DISI | STRIBUTION |
|------------|-------|--------------------|--------|--------|------------|
| Edk (psi) | c | Range (psi) | c | œ | c |
| | | | I | | 67 |
| -12,000 | T | | | 1.5 | 1000 |
| -11,000 | I | | | -1.2 | 20 |
| -10.000 | T | 1.000 | | -1.0 | |
| 000 | | 2 000 | | 0 | 10 |
| 000 | | 3 000 | | 0 00 | 101 |
| 0000 | | 000 | 0 | 0. | 181 |
| 000.1- | | 000,4 | 17,703 | 1:- | 236 |
| -6,000 | 0 | 000,0 | 4 /3/ | 0 | 310 |
| -5,000 | 01/2 | 000.9 | 0 293 | 5 | 43 |
| -4.000 | 1411 | 7,000 | 7/4/0 | 4 | 2 |
| -3.000 | 6,386 | 8.000 | 4,316 | 3 | 20 |
| 2000 | 113 | 000 6 | 1,301 | - 2 | 6 |
| 000 | 17 | 000 | 326 | | 47 |
| 000,1 | 0 | 000,01 | 55 | | 9 |
| 0 | 0 | 000,11 | 50 | 0 - | 89 |
| 0000 | 0 | 12,000 | 7 | - | 27 |
| 2,000 | C | 13,000 | 17 | 7. | 220 |
| 3.000 | | 14.000 | | .3 | 200 |
| 000 | 0 | 15,000 | 9 | 7 | 27.0 |
| 000 | 0 | 000 | 14 | · | 2,983 |
| 000.6 | 667 | 000,01 | 7 | . 4 | 177,01 |
| 0,000 | 0 | 000,71 | 0 | 9.1 | 9,610 |
| 000, | 125 | 000,81 | 21 | | 1,255 |
| 8,000 | 1.406 | 000.6 | 206 | 00.0 | 0 |
| 000.6 | 4.085 | 20,000 | 90/ | 6. | 0 |
| 10,000 | 2423 | 21,000 | 205 | 0.1 | 11 66 5 |
| + | 2,463 | 22.000 | 213 | | 3 |
| 1 | 1,067 | 23.000 | 1.341 | | |
| | 4.582 | 24,000 | 455 | | |
| 2,000 | 8,932 | 000.42 | 101 | | |
| | 3.185 | 000,62 | /3 | | |
| 15,000 | 1.481 | 26,000 | - | | |
| 16,000 | 210 | 27,000 | - | | |
| 17.000 | 410 | 28,000 | | | |
| 18,000 | 2 | 29,000 | | | |
| 10,000 | 27 | 30 000 | 2 | | |
| 000,000 | 4 | 000 | 0 | | |
| 70,000 | 7 | 31,000 | | | |
| 21,000 | 1 | 32,000 | | | |
| 22,000 | | 33,000 | I | | |
| 23.000 | 0 | 34,000 | | | |
| 24 000 | 7 | 35,000 | | | |
| 2000 | 1 | 0000 | | | |
| - | 0 | | | | |
| | | | | | |
| 21,000 | | | | | |
| 1 | I | | | | |
| | | | | | |

TABLE B-35 SPECTRUM BS1.FS5 (NO. 35)

DESCRIPTION: SPECTRUM NO. 1 CLIMB AND DESCENT STRESS TRANSFER FUNCTION SAME AS FOR CRUISE

ELIGHT HOURS = 2,500
TOTAL CYCLES = 43,575
RANGE TRUNCATION (PSI) = 4,000
HIGHEST PEAK (PSI) = 22,032

FLIGHTS = 2.528 AVERAGE NO. OF CYCLES PER:

VCLES PER: FLIGHT " 17.2 FLIGHT HOUR = 17.4 SMALLEST VALLEY (PSI) = -24.298

TABLE B-36 SPECTRUM BS6.ES1 (NO. 36)

DESCRIPTION: SPECTRUM NO. 6 WITH THE NUMBER OF GUST AND MANEUVER CYCLES INCREASED BY 15 PERCENT. FLIGHTS = 2.422

ELIGHT HOURS = 2,500

TOTAL CYCLES = 206,201

RANGE TRUNCATION (PSI) = 4,000

HIGHEST PEAK (PSI) = 23,923

AVERAGE NO. OF CYCLES PER: FLIGHT

LANDINGS

LES PER: FLIGHT = 85.1 FLIGHT HOUR = 82.5 SMALLEST VALLEY (PSI) = -24.298

DISTRIBUTION × RATGE DISTRIBUTION (154) 1,000 4,000 4,000 7,000 1,000 1,000 11,0 DISTRIBUTION: (181)

| Pange (psi) n Range (psi) n R n | PEAK DISTRIBUTION | NOTION | KANGE DISTRIBUTION | NOTION | R DIST | DISTRIBUTION | LLAN |
|--|-------------------|--------|--------------------|--------|--------|--------------|------|
| 1,000 | Peak (psi) | c | Range (psi) | c | œ | n | Ped |
| 1,000 1, | | | | | | 717 | |
| 1,000 2,000 | 200 | | | | -1.5 | 177 | - |
| 1,000 | 000 | | | | -1.2 | 200 | - |
| 2,000 2,/5/ 2,/5/ 2,000 2,44/ 4,000 2,44/ 2,000 2,44/ 2,000 2,44/ 2,000 2,44/ 2,000 2,44/ 2,000 2,44/ 2,000 2,44/ 2,000 2,44/ 2,000 2,44/ 2,000 2,44/ 2,000 2,44/ 2,000 2,44/ 2,000 2,04/ 2,000 2,04/ 2,000 2,04/ 2,000 2,04/ 2,000 2,04/ 2,000 2, | 000 | | 1,000 | | -1.0 | 200 | - |
| 3,000 6,266 6,266 6,000 6,266 6,000 6,266 6,000 6,266 6,000 6,266 6,000 6,266 6,000 6,266 6,000 6,266 6,000 6,266 6,000 6,266 6,000 6,266 10,000 6,266 10,000 6,266 10,000 6,266 10,000 6,266 10,000 6,266 10,000 6,266 10,000 6,266 10,000 10,0 | 000 | I | 2,000 | | 6 | 22 | _ |
| 1,000 22,/55 1,000 2,445 1,000 2,4 | 000 | | 3,000 | | 8 | 44 | |
| C 5,000 22,452 6 300 6,100 -2,445 6 300 6,100 -2,445 6 300 6,100 -2,445 6 300 6,100 -2,445 6 300 7,20 -3 -2 4 8,000 -3,15 7 4 4 9,000 -3,15 7 4 4 11,000 -4 -3 7 4 12,000 -7 7 7 7 7 14,000 -7 7< | 000 | | 000 | 0 | - 7 | 960 | |
| C C C C C C C C C C | 300 | | 2000 | 25/122 | ,, | 67 | |
| 5/57/7 7,000 6/5/37 -13 46 46 6/364 8,000 4,57 -13 46 52 10,000 307 -13 46 6 <td>300</td> <td>0</td> <td>000.6</td> <td>2445</td> <td>0:</td> <td>300</td> <td>_</td> | 300 | 0 | 000.6 | 2445 | 0: | 300 | _ |
| 1,000 4,629 -1,4 52 52 52 52 53 53 54 55 54 55 55 55 | 33 | 15/5 | 0000 | 10 033 | ·.5 | 87 | _ |
| | 30 | 1987 | 000.7 | 4.20 | 4:- | 23 | 1 |
| 1000 | 000 | 200 | 8,000 | 1,00,1 | 3 | 200 | _ |
| 1000 307 1000 307 1000 307 1000 307 1000 307 1000 307 1000 307 1000 307 1000 307 1000 307 1000 307 1000 307 1000 307 1000 307 1000 307 3 | 000 | 011 | 000 | 1,315 | | 0 | |
| 1,000 43 1,000 43 1,000 1,000 43 1,000 1,000 43 1,000 43 1,000 43 1,000 43 1,000 43 1,000 1,00 | 000 | 89/ | 000 01 | 307 | !- | 48 | _ |
| 1,000 2,1 1,000 | 3 | 0 | 000 | 43 | : | 7 | _ |
| 1,000 3 3 244 1 1 1 1 1 1 1 1 1 | 0 | (| 000. | 15 | 0 | 10 | _ |
| 13,000 | 000 | | 12.000 | | | | _ |
| 1 1000 1 1 1 1 1 1 1 | 000 | 0 | 13 000 | 1 | 2 | 3.0 | |
| 15,000 | 200 | 0 | 900 | 6/ | , . | 249 | _ |
| 15,000 | 3 | 0 | 000.4 | 0 | 5. | 263 | _ |
| 6,000 7 5 7 5 7 5 7 7 5 7 7 | 000 | | 15,000 | , | 4. | 2001 | _ |
| 1,000 | 000 | 0 | 16,000 | 7/ | 2 | 3,007 | _ |
| 18,000 13 19,000 13 19,000 | 000 | 499 | 17 000 | _ | | 14,3/2 | _ |
| S S S S S S S S S S | 200 | 15 | 000,71 | /3 | 0.1 | 9,421 | _ |
| 946 19,000 263 . | 3 | 0 | 8,000 | · | - | 545 | _ |
| 1.00 1.9 0.0 | 000 | 040 | 19,000 | 27.2 | 8. | - | |
| 1.0 | 000 | 1 | 20.000 | - | 6. | , | |
| 1,665 1,620 1,645 1,64 | 000 | 1,613 | 21 000 | 214 | 10 | 0 | |
| 304 23,000 446 23,000 446 24,000 34 34 35,000 2 25,000 2 27 26,000 2 27 26,000 2 27 27,000 2 27 26,000 2 27 26,000 2 27 30,000 2 27 30,000 2 27 30,000 2 27 30,000 2 32,000 32,000 35,000 3 | 200 | 1,011 | 2000 | 1,230 | 2. | 11,665 | _ |
| 6,697 23,000 7,553 25,000 6,697 24,000 35,000 6 65 27,000 7 28,000 87 29,000 87 30,000 83,000 6 83,000 6 83,000 6 83,000 6 83,000 7 85,000 7 | 000 | 306 | 000,22 | 744 | | | _ |
| 1, 56.3 25,000 35 25,000 6 25 25,000 6 25 25,000 6 25 25,000 6 25 25,000 7 25 25,000 7 25 25,000 7 25 25,000 7 25 25,000 7 25 25,000 2 | 000 | 16077 | 23,000 | ne | | | |
| 1, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, | 000 | 200 | 24.000 | | | | - |
| 2.455 2.455 4.55 25,000 4.55 27,000 7 28,000 2 28,000 6 31,000 7 31,000 8 34,000 8 35,000 | 000 | 11,063 | 25,000 | 35 | | | _ |
| 455 27,000 7 27,000 7 27 30,000 2 27,000 2 27,000 2 27,000 2 27,000 2 27,000 2 37,000 2 37,000 2 37,000 2 37,000 2 37,000 2 37,000 3 | 200 | 2,45/ | 000,03 | 9 | | | 71 |
| 2 28,000 | 3 | 455 | 2000 | - | | | 1 |
| 28,000 C 27 30,000 C 31,000 C 31,000 C 31,000 C 31,000 C 33,000 C 33,000 C 33,000 C 33,000 C 33,000 C 33,000 C | 000 | 1 | 27,000 | - | | | |
| 27 29,000 27 30,000 2 30,000 2 33,000 35,000 35,000 | 000 | 7 | 28 000 | - | | | _ |
| 2 30,000 | 200 | 20 | 000 | 0 | | | _ |
| 7 31,000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 3 | 27 | 29,000 | 2 | | | 30 |
| 31,000 | 000 | 1 | 30,000 | | | | |
| 2 32,000 2 33,000 3 4,000 3 5,000 | 000 | 11 | 31,000 | | | | |
| 33,000 | 000 | + | 32 000 | | | | - 50 |
| 33,000 | 3 | 0 | 32,000 | | | | - 2 |
| 35,000 | 000 | 0 | 33,000 | | | | - |
| 35,000 | 00 | 1 | 34 000 | | | | 77 |
| | 200 | 0 | 200 | | | | 2 |
| | 3 | | 35,000 | | | | 16 |
| | 000 | | | | | | .7 |
| | 000 | | | | | | 37 |
| | | | | | | | 75 |
| | 000 | | | | | | |
| | 1 | | | | | | _ |
| | | | | | | | |

78 78 772 272 869 3,584 (8,370 (03,552 942

275

0.87.954.65

66,395 75,307 27,820 8,655 2,481

13,449

100

1, 140 952 429 116 392

534/6 53

0

TABLE B-37 SPECTRUM BS6.ES2 (NO. 37)

DESCRIPTION: SPECTRUM NO. 6 WITH THE NUMBER OF GUST AND MANEUVER CYCLES DECREASED BY 15 PERCENT. FLIGHTS = 2,422 FLIGHT HOURS = 2,500

TOTAL CYCLES = 157,494

RANGE TRUNCATION (PSI) = 4,000

HIGHEST PEAK (PSI) = 23,923

FLIGHTS = 2.422 LANDINGS = 3.843

AVERAGE NO. OF CYCLES PER: FLIGHT = 65.0

FLIGHT HOUR = 63.0

SMALLEST VALLEY (PSI) = -24.298

FLIGHTS = 2,422 LANDINGS = 3,843
AVERAGE NO. OF CYCLES PER: FLIGHT = 105.8
FLIGHT HOUR = 102.5
SMALLEST VALLEY (FSI) = -24,298 DESCRIPTION: SPECTRUM NO. 6 WITH THE SLOPE OF GUST AND MANEUVER EXCEEDANCES SPECTRA INCREASED 15 PERCENT.

TABLE B-38 SPECTRUM BS6.ES3 (NO. 38)

ELIGHT HOURS = 2,500

TOTAL CYCLES = 256,217

RANGE TRUNCATION (PSI) = 4,000

HIGHEST PEAK (PSI) = 23,923 PEAK DISTRIBUTION

| Peak (psi) | PEAK DISTRIBUTION | UTION | RANGE DISTRIBUTION | NOITUS | R DIS | DISTRIBUTION |
|--|-------------------|--------|--------------------|--------|-------|--------------|
| 250 1,000 1,286 6,000 1,286 6,000 1,286 6,000 1,286 6,000 1,286 6,000 1,286 6,000 1,286 6,000 1,286 6,000 1,286 6,000 1,286 6,000 1,286 6,000 1,266 1,000 1,00 | | c | | c | æ | c |
| 1,000 1,00 | | 0 | | | u | 248 |
| 1,000 2,00 | 000 | 50 | | | 0.0 | 685 |
| 1,000 1,00 | 000 | 0 | 000 | | 7.1- | 583 |
| 200 3,000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 000,01- | 7. | 000,1 | | 0.1- | 832 |
| 1000 | 000.6- | 0 | 7,000 | | 5. | 498 |
| 695 4,000 99,407 6 | -8,000 | 200 | 3,000 | 0 | 00.1 | 687 |
| 1,368 5,000 9/,920 -5,6 6,000 9/,920 -5,5 6,000 9/,920 -2,3 6,000 9/,920 -2,3 6,000 9/,920 -2,3 6,000 9/,920 -2,3 6,000 9/,920 -2,3 6,000 9/,920 -2,3 6,000 9/,920 -2,3 6,000 13,000 2,554 -2,2 10,000 2/,920 -2,2 10,000 2/,920 -2,2 10,000 2/,920 -2,2 10,000 2/,920 -2,2 10,000 2/,920 -2,2 10,000 2/,920 -2,2 10,000 2/,920 -2,2 10,000 2/,920 -2,2 10,000 2/,920 -2,2 10,000 2/,920 -2,2 10,000 2/,920 -2,2 10,000 2/,920 -2,2 10,000 2/,920 -2,2 10,000 | 000.1- | 895 | 4,000 | 104.99 | 1 | 338 |
| 30064 7,000 34763 5 | 000.4- | 1,388 | 2,000 | 9/930 | 9. | 196 |
| 1,000 13,768 3 | 000,6- | 3,084 | 000,0 | 39.703 | 5.5 | 101 |
| 1559 9,000 3,659 7.2 1,000 2,554 7.2 1,000 2,554 7.2 1,000 2,554 7.2 1,000 2,554 7.2 1,000 2,554 7.2 1,000 2,554 7.2 1,000 2,554 7.2 1,000 2,554 7.2 1,000 2,554 7.2 1,000 2,554 7.2 1,000 2,554 7.2 1,000 2,554 7.2 1,000 2,554 7.2 2,464 2,554 7.2 2,000 2,554 7.2 3,000 2,544 7.2 3,000 2,544 7.2 | 000.4 | 6,998 | 000, | /3.588 | 4. | 59 |
| 1000 2.55¢ 1000 | 2,000 | 759 | 2000 | 3,659 | 2.0 | 64 |
| 1 1000 735 1 1 1000 735 1 1 1000 249 1 1 1000 249 1 1 1000 249 1 1 1000 249 1 1 1000 249 1 1 1 1 1 1 1 1 1 | 000,2- | 9 10 | 000,6 | 2,504 | 7.5 | 69 |
| 1,000 249 1,000 12,000 12,000 12,000 13,000 24,000 12,000 24,000 | 0001- | 1 | 000,01 | 735 | | 101 |
| 1,000 94 1,000 | 000 | 0 | 000,51 | 548 | 0 - | 061 |
| 1,000 2/ 1,000 2/ 1,000 2/ 1,000 2/ 1,000 2/ 1,000 2/ 1,000 2/ 1,000 1/0.5 1,000 1/0.5 1,000 1/0.5 1,000 1/0.5 1,000 1/0.5 1,000 1/0.5 1,000 1/0.5 1,000 1/0.5 1,000 1/0.5 1,000 1/0.5 1,000 1/0.5 1,000 1/0.5 1,000 1/0.5 1,000 1,000 1/0.5 1,000 1 | 000, | 0 | 12,000 | 46 | | 226 |
| 15,000 17,000 1 | 2,000 | 0 | 13,000 | 21 | 7. | 1,798 |
| 3.64 15,000 | 3,000 | 0 | 14,000 | 21 | ٠. | 6,623 |
| 15.000 | 4,000 | 364 | 15,000 | // | 4. | 28,113 |
| 1,000 1,63 1,000 1,63 1,000 1,63 1,000 1,63 1,000 1,63 1,000 1,63 1,000 1,63 1,000 1,65 1,000 | 000.0 | 358 | 16,000 | 12 | 5. | 81.617 |
| 18,000 103 17 17 17 17 17 17 17 1 | 0,000 | 105 | 17,000 | 0/ | 9. | 118.318 |
| 1000 102 103 | 7,000 | 364 | 18,000 | 103 | .7 | 1.141 |
| 100 | 8,000 | 6.856 | 19,000 | (0) | 8. | 0 |
| 46,733 21,000 1,1/5 42,552 23,000 960 53,672 24,000 76 7,446 26,000 26 1,62 31,000 7 6 33,000 7 7 34,000 7 6 33,000 7 7 34,000 7 6 33,000 7 7 34,000 7 | 000.6 | 24.992 | 20,000 | 35/ | 6. | 0 |
| 1,2,552 22,000 96.0 1,3,64.5 25,000 96. | 10,000 | 46 /33 | 21,000 | 1112 | 1.0 | 13 110 € |
| 13,577 23,000 13,577 23,000 24,000 24,000 26,000 2 | 000,11 | 42 552 | 22,000 | 276 | | 211/21 |
| 3,84/2 24,000 3,8/2 25,000 3,6/2 25,000 3,6/2 27,000 3,6/2 27,000 3,6/2 27,000 3,6/2 27,000 3,00 | 12,000 | 53.5/7 | 23,000 | 483 | | - |
| 25,000 10,484 21,444 21,444 21,444 28,000 16,2 16,2 10,000 16,2 10,000 16,2 10,000 | 13,000 | 13 847 | 24,000 | 100 | | |
| 100 46 | 14,000 | 38 920 | 25,000 | 270 | | |
| 27,000 3,64 28,000 28,000 29,000 162 31,000 10 10 10 10 10 10 10 10 10 | 15,000 | 10 401 | 26,000 | 000 | | |
| 28,000 52/ 31,000 (62 31,000 6 33,000 7 34,000 7 35,000 | 16,000 | 2 144 | 27,000 | 27 | | |
| 29,000 (62 31,000 (62 31,000 (6 32,000 (6 33,000 (7 34,000 (9 34,000 (9 35,000 | 17,000 | 380 | 28,000 | 2.0 | | |
| 7,62 30,000 4,700 6 32,000 7 34,000 7 35,000 9 35,000 | 18,000 | 125 | 29,000 | 7 | | _ |
| 31,000 6 32,000 7 34,000 0 35,000 | 19,000 | (4.2) | 30,000 | | | |
| 0-0 | 20,000 | 100 | 31,000 | | | |
| 0 - 0 | 21,000 | 14 | 32,000 | | | |
| 2-0 | 22,000 | | 33,000 | | | |
| | 23.000 | 0 | 34,000 | | | |
| 0 | 2000 | - | 25 000 | | | |
| 27,000 | 2000,47 | 0 | 000,00 | | | |
| 27,000 | 20,000 | | | | | |
| | 2000 | | | | | |
| | 000'. 7 | | | | | |
| | 1 | | | | | _ |

| Peak (ps1) n -12,000 0 -10,000 7 -9,000 2/0 -7,000 2/0 -7,000 73/6 -6,000 4/3/8/0 -4,000 3/6/0 | Range (psi) | L. | R | u |
|---|-------------|--------|------|--------|
| | | | | |
| | | | | |
| | | | | P72 |
| | | | | 619 |
| | | | 7.1- | 582 |
| | 000 | | 0.1- | 100 |
| | 2,000 | | 6 | 100 |
| | 3 000 | | 00 | 4/6 |
| | 000 | 0 | | 149 |
| | 000,1 | 64,121 | 1 | 544 |
| | Г | 56.952 | 0,1 | 204 |
| + | T | 22006 | 5 | 101 |
| | Т | 44,001 | 4 | 9 |
| 1 | 8,000 | 1/0/1 | - 3 | 000 |
| 2 000 | 0000 | 142'2 | 2 | 64 |
| 2000 | 000 | 879 | 7.5 | 29 |
| 2 000 | 000.01 | 241 | | 44 |
| - | 000. | 77 | 0 | 1112 |
| 000.1 | 12,000 | חח | - | 2/0 |
| | 13,000 | | .2 | 100 |
| - | 14.000 | 2 | .3 | 200 |
| - | 15,000 | 9/ | 4 | 2,573 |
| 364 | 000 | 0/ | | 14,103 |
| | 000.01 | 11 | 0. | HLL'HH |
| + | 000,71 | 20 | ۰ | 76.426 |
| 1 | 18,000 | 000 | -1. | 712 |
| 0 | 19,000 | 1001 | 8. | |
| 1 | 20.000 | | 6. | 0 |
| | 1 | 473 | 0. | 0 |
| 13,000 25,780 | | 1601 | - | 13,481 |
| | 000,22 | 990 | | |
| 1 | T | 374 | | |
| 1 | T | 7.6 | | |
| 1 | T | 100 | - | |
| 7 | Т | 271 | | |
| 15,000 5,200 | | 92 | | |
| | | 145 | | |
| - | 1 | 27 | | |
| 18,000 | Т | 6 | | |
| + | T | 0 | | |
| • | 31.000 | 7 | | |
| | 32 000 | - | | |
| 4 | 2000 | 0 | | |
| 22,000 | 33,000 | | | |
| 23,000 | 34,000 | | | |
| 24,000 | 35,000 | | | |
| 25,000 | 1 | | | |
| 26,000 | T | | | |
| 27,000 | | | | |
| 000', 4 | | | | |
| | | | | |
| - | T | - | | |

TABLE B-39 SPECTRUM BS6.ES4 (NO. 39)

DESCRIPTION: SPECTRUM NO. 6 WITH THE SLOPE OF GUST AND MANEUVER EXCEEDANCES SPECTRA DECREASED 15 PERCENT.

FLIGHT HOURS = 2.500
TOTAL CYCLES = 117.516
RANGE TRUNCATION (PSI) = 4.000
HIGHEST PEAK (PSI) = 22.694 HIGHEST PEAK (PSI)

FLIGHTS = 2,528

AVERAGE NO. OF CYCLES PER: FLIGHT = 18.1

FLIGHT HOUR = 18.3

SMALLEST VALLEY (PSI) = -27,943

FLIGHT HOURS = 2,500

TOTAL CYCLES = 45,807

RANGE TRUNCATION (PSI) = 4,000 (1.15)

HIGHEST PEAK (PSI) = 25,431

DESCRIPTION: SPECTRUM NO. I STRESSES INCREASED 15 PERCENT.

TABLE B-40 SPECTRUM BSI.DSLI (NO. 40)

FLIGHTS = 2,422 LANDINGS = 3.843
AVERAGE NC. OF CYCLES PER: FLIGHT = 48.5
FLIGHT HOUR = 47.0
SMALLEST VALLEY (PSI) = -24,298

| DISTRIBUTION | u | 1/ | 9901 | 87 | 15 | 96 | 161 | 182 | 303 | 147 | 25 | 0 | 47 | 7 | 68 | 30 | 23.6 | 300 | 2000 | 1000 | 1000 | 1.210 | | 0 | 11 66.5 | 200 // | | - | | | | | | | | | | | | | | _ |
|-------------------|-------------|---------|---------|---------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| R DIST | Ŗ | -1.5 | -1.2 | 0.7 | 6 - | | 2. | 1 | 0.1 | 6 | 4.1 | | 7.5 | - | 0 | - | .2 | .3 | .4 | 5. | 9. | .7 | 8. | -6. | 1.0 | | | | | | | | | | | | | | | | | |
| UTION | n | | | | | | 0 | 3,899 | 19,431 | 3,281 | 10.210 | 1,388 | 3.547 | 1001 | 301 | 65 | 33 | 90 | 0, | | 00 | 2 | 1 | 777 | | 001 | 101 | 200 | 6421 | 388 | 145 | 33 | 11 | 0 | 0 | 30 | | 10 | | | | |
| PAGE DISTRIBUTION | Pance (psi) | - | - | 1.000 | 2 000 | 3 000 | 000 | 000 | 000.0 | 000,0 | 000,7 | 8,000 | 9,000 | 10,000 | 11,000 | 12,000 | 13,000 | 14,000 | 15,000 | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 21,000 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 | 28,000 | 29,000 | 30,000 | 31,000 | 32,000 | 33,000 | 34,000 | 35,000 | | | |
| UTION | n | | | | | | | 0 | 5,151 | S,417 | 406 | 011 | 8/ | 0 | | I | I | I | * | 7007 | | 0 | | 0 0 | 700 | 2,170 | 1,000 | 103 | 1 2/5 | 10101 | 4.456 | 1. (3) | 509 | 201 | 37 | 90 | 27 | 7 | | 2 | 2 | 0 |
| PEAK DISTRIBUTION | Peak (isi) | -12.000 | -11,000 | -10 000 | 0000 | 8 000 | 2,000 | 0001 | 200,0- | 000.4- | -4,000 | -3,000 | -2,000 | -1,000 | 0 | 1,000 | 2,000 | 3,000 | 4,000 | 5,000 | 6,000 | 7,000 | 8,000 | 000.6 | 10,000 | 11,000 | 12,000 | 13,000 — | 14,000 | 15,000 | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 21,000 | 22,000 | 23,000 | 24,000 | 25.000 | 26,000 | 27,000 |

| Peak (psi) | DISTRIBUTION | | SUTION | R DIS | DISTRIBUTION |
|------------|--------------|-------------|--------|-------|--------------|
| | c | Range (psi) | = | ~ | c |
| 1 | 0 | | | | 297 |
| -12,000 | 42 | | | 0.5 | 693 |
| 000'11- | 0 | 000 | | 7.1- | 575 |
| -10,000 | 4 | 000. | | 0.1- | 923 |
| 000,6- | 0 | 000,5 | | 2.0 | 408 |
| 000 | 207 | 3,000 | 0 | 0 1 | 869 |
| 000.7- | 926 | 000,4 | 5//58 | 1: | 282 |
| 000 | 1,369 | 000.6 | 4/805 | 0 | 208 |
| 000.6- | 3.08/ | 000,000 | 14.090 | 0: | 83 |
| 000 | 7.0.7 | 000, | 4.245 | 4.0 | 09 |
| 000 | 758 | 000 | 1,726 | | 64 |
| 000,2- | 50 | 000,6 | 387 | 7.5 | 09 |
| 000, | 2 | 000,01 | 112 | | 69 |
| 000 | 0 | 000,11 | 39 | 0. | 86 |
| 000 | 0 | 000,21 | 50 | | /37 |
| 2,000 | | 13,000 | 101 | .2 | 296 |
| 0000 | | 14,000 | 12/ | .3- | 1/63 |
| 4.000 | | 15.000 | 3 | 4. | 00111 |
| 2 000 | 384 | 16,000 | 0 | 2 | 2,000 |
| 000 | 358 | 17 000 | 11 | 1 | 29,421 |
| 000, | 96 | 1000 | 26 | | 60,021 |
| 000 | /43 | 000,01 | 111 | | 526 |
| 000 | 2,225 | 000,61 | 128 | • | 0 |
| 000,6 | 10,636 | 000,02 | 477 | 2. | 0 |
| 0,000 | 23.458 | 000,12 | 1,186 | 0 | 13,466 |
| 000,1 | 2/282 | 22,000 | 676 | | |
| 2,000 | 2/092 | 23,000 | 360 | | |
| 3,000 | 2000 | 24,000 | 200 | | |
| 4.000 | 2,000 | 25,000 | 202 | | |
| 5 000 | 13,340 | 26.000 | 5/3 | | |
| 000 | 2,788 | 27,000 | 6/ | | |
| 000 | 639 | 200,000 | 143 | | |
| 000,01 | 72 | 200,000 | 22 | | |
| 000. | 55 | 000,63 | 7 | | |
| 0000 | à | 30,000 | 0 | | |
| 20,000 | | 31,000 | | | |
| 21,000 | , | 32,000 | | | |
| 000 | 3 | 33.000 | | | |
| 000 | | 34 000 | | | |
| 000 | 0 | 000 | | | |
| 74,000 | | 35,000 | | | |
| 25,000 | | | | | |
| 26,000 | | | | | |
| 27,000 | 1 | | | | |
| - | I | | | | |
| | | | | | |

TABLE B-41 SPECTRUM BS3.DSL1 (NO. 41)

FLIGHTS = 5,112

AVERAGE NO. OF CYCLES PER: FLIGHT = 127.0

FLIGHT HOUR = 259.7

SMALLEST VALLEY (FSI) = -18,046 DESCRIPTION: SPECTRUM NO. 3 STRESSES INCREASED 15 PERCENT. FLIGHT HOURS = 2,500

TOTAL CYCLES = 649,353

RANGE TRUNCATION (PSI) = 4,000 (1.15)
HIGHEST PEAK (PSI) = 28,297

DESCRIPTION: SPECTRUM 4 STRESSES INCREASED 15 PERCENT.

TABLE B-42 SPECTRUM BS4.DSLI (NO. 42)

FLIGHTS = 3,111

AVERAGE NO. OF CYCLES PER: FLIGHT = 64.0

FLIGHT HOUR = 79.6

SMALLEST VALLEY (FSI) = -32,180 FLIGHT HOURS = 2,500
TOTAL CYCLES = 199,036
RANGE TRUNCATION (PSI) = 4,000 (1.15)
HIGHEST PEAK (PSI) = 33,167

| DISTRIBUTION | u | 12 | - 1 | /20 | 1,963 | 760 | 1.920 | 334 | 67 | 0 | 52 | 2 | AL | " | 5// | 359 | 1.797 | 7,276 | 180'62 | 166,302 | 411,674 | 1,850 | 00 | 25.548 | | | | - | | | | | | | | | | | | | |
|--------------------|-------------|---------|---------|-------|-------|--------|--------|---------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------------|---------|--------|--------|--------|--------|---------|---------|---------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|
| R DISTR | R | -1.5 | -1.2 | | 0.0 | | 100 | /- | 9 | 5 | 4 | 3 | 2 | 7 | 0, | - 0 | 7: | 2. | 4.10 | . 9 | 7 | 8. | 6. | 1.0 | | | | | | | | | | | | | | | | | |
| E01103 | u | | | | | | 0 | 210 040 | 287.444 | 14.293 | 91.05 | 976 56 | 3 533 | 4.182 | 1,076 | 7 | 268 | 85 | /3 | 26 | " | 0 | | | 1 | 225 | 1,227 | 792 | 672 | 6/2 | M67 | 63 | 347 | 43 | 2 | 2) | , | 0 | | | |
| Water DISTRIBUTION | Pange (psi) | | | 1 000 | 000 | 000.5 | 3,000 | 4,000 | 2,000 | 0000,9 | 7,000 | 8,000 | 0000,6 | 10,000 | 11,000 | 12,000 | 13,000 | 14,000 | 000,61 | 17,000 | 18.000 | 19,000 | 20,000 | 21,000 | 22,000 | 23,000 | 25.000 | 26,000 | 27,000 | 28,000 | 29,000 | 30,000 | 31,000 | 32,000 | 33,000 | 35,000 | 34,000 | 37,000 | | | |
| 101104 | u | | 0 | S | 7 | 0 | 0 | 200 | 4878 | 7.754 | 0 /2/ | 625 | 57 | | 0 | | | | | > | 0 | 480 | 000 | 1 | 0 | 144,802 | 149'241 | 158,999 | 13.959 | 27 107 | 1 643 | 5.368 | 1,127 | 33 | 186 | 36 | 2 | /3 | 2 | 0 | |
| PLAK DISIRIBULION | Peak (psi) | -12.000 | -11 000 | 1000 | 000,0 | 000.6- | -8,000 | 000.1- | -0000,9- | 2,000 | -4,000 | -3,000 | -5,000 | -1,000 | 0 | 1,000 | 2,000 | 3,000 | 000 | 000,6 | 7,000 | 8,000 | 000,5 | 000,01 | 11,000 | 12,000 | 1 | T | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 2000,12 | 22,000 | 24,000 | 25,000 | 26,000 | 27,000 | 28,000 | 29,000 |

| (psi) | | DISTRIBUTION | RANGE DISTRIBUTION | BUTION | R DIS | DISTRIBUTION |
|--|------------|--------------|--------------------|--------|----------|--------------|
| 1,000 1,1/2 1,000 1,1/2 1,000 1,00 | Peak (psi) | u | | c | u | u |
| 1,000 1,00 | | | | | | |
| 1,000 1,376, -1.2 | -12 000 | | | | | 27/ |
| 1,000 1,47,47 1,000 1, | 000 | | | | | 2,176 |
| 1,000 1,00 | 000 | | 000 | | 7.1 | 4,165 |
| 1,000 1,476, 1,00 | 000,01- | | 000. | | 0.1- | 4.124 |
| 7. 14.74 1. 16.35 1. 16. | 000.6- | | 000,2 | | 6 | 2.767 |
| 1,000 1,346 -2,000 1,476 -3,000 1,466 -3,000 1,466 -3,000 1,466 -3,000 1,466 -3,000 1,466 -3,000 -3,447 -3,477 | 2,000 | | 3,000 | 0 | 0. | 1.22.1 |
| 1,000 1,447 1,447 1,44 | 000.7- | 0 | 4,000 | 14.761 | | 1,762 |
| 1, | -0,000 | 9.839 | 000.5 | 83./67 | 0 | 1/7 |
| 1,635 1,000 2,6,844 1,000 2,6,844 1,000 2,446 | -000,6- | 20. /66 | 000.0 | 31346 | 5 | 267 |
| 481 9,000 12,628 19,000 12,00 | 2,000 | 11,835 | 7,000 | 26.844 | 4 | 341 |
| 1000 | -3,000- | 481 | 8,000 | 12 428 | | 050 |
| 1,000 2,446 1,000 1,000 2,446 1,000 1,000 2,446 1,000 2,446 1,000 2,446 1,000 2,446 1,000 2,446 1,000 2,26 1,000 2,26 1,000 2,26 1,000 2,26 1,000 2,26 1,000 2,26 1,000 2,26 1,000 2,26 1,000 2,26 1,26 1,000 2,26 1,26 1,000 2,26 1,26 1,000 2,26 1,26 | -2,000 | 55 | 000,6 | 4.497 | 2 | 308 |
| 1,000 1,00 | 000.1- | 0 | 10,000 | 2 496 | | 627 |
| 1,000 1,00 | 0 | Y | 11,000 | 670 | 0 | 205 |
| 1,000 1,02 1,000 1,02 1,000 | 1,000 | | 12,000 | SW | - | 889 |
| 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | 2,000 | F | 13,000 | 102 | -2- | 733 |
| 15. 000 1 25. 000 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 3,000 | I | 4,000 | 900 | .3 .3 | 0000 |
| 1,345 1,345 1,000 1,00 | 4,000 | | 15,000 | 200 | 4. | 2,540 |
| 1,245 17,000 1,626 18,000 25 1,626 18,000 25 1,626 18,000 25 1,626 1 | 5.000 | 0 | 16,000 | 48 | .5 | 25,574 |
| 15 15 15 15 15 15 15 15 | 6.000 | 4,345 | 17,000 | 801 | . 4 | 59,546 |
| 255 20,000 35 1.0 2 2 2.0 2.0 2 2 2.0 2.0 2 2 2 2 2 2 2 | 2000 | 1,236 | 18,000 | 35 | 0.1 | 44,815 |
| 2.5 | 000 | 0 | 000,01 | 58 | | 1,363 |
| 3.870 2.000 3.5 1.9 1.0 1.5 1.0 1.5 1.0 1.5 1.0 1.5 1.0 1.5 1.0 1.5 1.0 1.5 1.0 1.5 1.0 1.5 1.0 1.5 1.5 1.0 1.5 | 000 | 235 | 000,60 | 11 | , o | 0 |
| 1,000 1,00 | 000,6 | 3,8% | 000,02 | 35 | 6. | 0 |
| 7 198 52 | 11,000 | 15,877 | 000,17 | 52 | 0.1 | 42,376 |
| 23,000 1,004 1 | 12,000 | 29,881 | 000,22 | 765 | | |
| 12,044 24,000 24,000 24,000 24,000 24,400 24,000 24,400 24,000 24,400 24,000 24,400 24,000 24,400 24,000 24,400 24,000 24,400 2 | 000,21 | 24,448 | 23,000 | 7.874 | | |
| 000, 62 | 13,000 | 12,044 | 24,000 | 3, 532 | | |
| 27, 195, 195, 195, 195, 195, 195, 195, 195 | 14,000 | 17,777 | 000,62 | 4,761 | | |
| 100 | 000,61 | 142,42 | 000,02 | 3,069 | | |
| 000,00 1,687 000,00 1,687 1,000 | 16,000 | 8,433 | 27,000 | 880 | | |
| 7,687 1,687 1,687 1,000 1,688 1,000 1, | 000,71 | 9,638 | 28,000 | 332 | | |
| 30,000 527 247 32,000 12,400 24,000 26,800 35,000 14,000 17,000 18,000 18,000 19,0 | 000,81 | 1,881 | 29,000 | 19 | | |
| 227 31,000 247 33,000 134 34,000 88 35,000 13 7 7 8 8 8 8 9 8 9 8 9 8 9 8 9 9 9 9 9 9 | 000,61 | 1.808 | 30,000 | 34 | | |
| 247 33,000 134 34,000 34,000 14 17 18 18 19 19 19 19 19 19 19 19 19 19 | 000,02 | 527 | 31,000 | " | | |
| 134 34,000 35,000 35,000 37,0 | 21,000 | 247 | 32,000 | 14 | | |
| 34,000 1,34,000 1,34 1,3 1,3 1,3 1,3 1,3 1,3 1,3 1,4 1,4 1,4 1,4 1,4 1,4 1,4 1,4 | 22,000 | /36 | 33,000 | 9 | | |
| 35,000 12 12 13 14 14 15 16 17 18 18 18 18 18 18 18 18 18 18 | 23,000 | 88 | 34,000 | - | | |
| 2/ 9 13 14 14 17 | 24,000 | 65 | 35,000 | 7 | | |
| 2/ 9 18/ 18/ 18/ 18/ 18/ 18/ 18/ 18/ 18/ 18/ | 25,000 | | | 9 | | |
| , see 1, | 26,000 | 7 | | - | | |
| 6 6 | 27,000 | 42 | 1 | 20 | | |
| + | 28,000 | /3 | | 0 | | |
| | 29,000 | 9 | | | | |
| | | 12 | | | | _ |

TABLE B-43 SPECTRUM BS6.DSL1 (NO. 43)

DESCRIPTION: SPECTRUM NO. 6 STRESSES INCREASED 15 PERCENT.

| FLIGHT HOURS | | 2,500 | FLIGHTS = 2.422 | LANDINGS | | 3,843 |
|------------------------|---|--------------|----------------------------|------------------------|----|---------|
| TOTAL CYCLES | | 181,644 | AVERAGE NO. OF CYCLES PER: | FLIGHT | | 75.0 |
| RANGE TRUNCATION (PSI) | " | 4,000 (1.15) | | FLIGHT HOUR = | 11 | 72.7 |
| HIGHEST PEAK (PSI) | | 27.512 | SMALLES | MALLEST VALLEY (PSI) = | | -27.943 |

| (1981) | 1000 1 | 24 | SUTION | | UTION | R DIST | DISTRIBUTION |
|--|--|------------|--------|-------------|--------|--------|--------------|
| 1000 | 1000 | Peak (psi) | c | Range (psi) | u | R | u |
| 1 | 1000 | - 13,000 | 47 | | | | |
| 1000 | 1000 | 000 | 0 | | | -1.5 | 277 |
| 1000 | 1000 | 000 | 7 | | | -1.2 | 269 |
| 1000 | 1000 | 000 | - | 1 000 | | | 557 |
| 194 3,000 1,000 | 194 | 000 | 2 | 2000 | | 0.0 | 869 |
| 3.07 3.07 3.07 3.07 3.07 3.07 3.07 3.07 3.07 3.000 2.00 | 3.07 | 000 | 66/ | 2000 | | 5. | 790 |
| 1000 | 1000 | 600, | 302 | 3,000 | < | 8:- | 700 |
| 3,747 3,747 3,748 3,096 3,096 3,096 3,000 2,000 11,000 11,000 12,000 12,000 13,000 14,000 14,000 15,000 16,000 17,000 17,000 18,000 19,000 | 1000 | 000, | | 4.000 | | | 24 |
| 1000 | 1000 | 000 | 63/ | 5,000 | 12,571 | - 6 | 333 |
| 1,000 2,00 | 1000 | 000 | 3,77/ | 200 | 76.076 | 0.1 | 197 |
| 1,006 1,000 1,00 | 3,096 7,000 2,00 | 000, | 5667 | 000,0 | 10 /23 | 5 | 00 |
| 1,000 1,36 | 1000 | 000 | 2000 | 7,000 | 1000 | 4 | 76 |
| 1000 | 1000 | 000 | 3,070 | 8,000 | 24.374 | 3 | 28 |
| 1000 136 | 10,000 1,360 1,3 | 000 | 37/ | 000 | 8467 | | 07 |
| 0,000 1,36 | 0,000 1,36 | 000 | 20 | 3,000 | 9/0 6 | 7:- | 8.7 |
| 11,000 13,000 1 | 1000 | 000 | | 10,000 | 100 | - | 2 |
| 1,000 1,00 | 1,000 1,00 | 0 | - | 11.000 | 7960 | 0 | |
| 1,000 1,00 | 1,000 1,00 | 000 | 0 | 000 | 386 | | 6// |
| 13,000 14 15 15 15 15 15 15 15 | 13,000 14 15 15 15 15 15 15 15 | 000, | * | 12,000 | 16 | - | 3776 |
| 14,000 19,000 1 | 14,000 16,000 1 | 000 | | 13,000 | - | .2 | 613 |
| 1, 000 1 | 15,000 14 15 15 15 15 15 15 15 | 000 | | 000 1 | 2 | | 793 |
| 15,000 16,000 16,000 17,000 17,000 18,000 1 | 1000 | 000 | , | 000,41 | 44 | ? | 3/55 |
| 1000 1 | 1,000 | 000 | | 000,61 | ~ | 4. | 20/ |
| 1,000 1,00 | 100 | 000 | 0 | 16.000 | 200 | 2 | (5/19) |
| 196 | 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | 000 | 909 | 17 000 | 4 | | 52,775 |
| 100 | 94 18,000 1,004 | 000 | /36 | 000,71 | Q | 0.1 | 89.73/ |
| 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | 000 | 20 | 18,000 | | 1. | 639 |
| 3,564 20,000 54 | 1.0 | 000 | 601 | 19,000 | 2 | 8. | - |
| 1,071 21,000 54 1.0 | 1,071 21,000 54 1.0 | 000 | | 20.000 | 2 | 6 | 0 |
| 1, 971 21,000 50 1, 971 1, 97 | 1,071 21,000 56 | 000 | 2/261 | 21 000 | 34 | | 0 |
| 6,709 22,000 1/7 1/2 | 6,709 22,000 1/2 | 000 | 11,0% | 000,13 | 50 | 0 | |
| 23, 240 24,000 25, 240 26, 272 27,000 28, 272 28,000 28, 272 28, 28,000 28, 272 28, 28,000 28, 272 28, 28,000 28, 272 28, 28,000 28, 28, 28,000 28, 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 | 23,000 23,240 31,527 31,527 24,000 25,607 25,000 26,667 26,000 26,667 26,000 27,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 38,000 38,000 4,000 28,000 | 600 | 8 709 | 72,000 | 11.7 | | 4 |
| 25,450 31,527 35,647 36,720 26,000 26,000 26,000 26,000 26,000 26,000 26,000 26,000 26,000 26,000 26,000 26,000 27,000 28,000 | 25,755 31,527 35,647 35,647 35,647 35,647 36,000 26,147 26,147 26,147 26,100 26,147 26,100 26,147 26,100 27,100 28,100 | 000 | 2000 | 23.000 | | | - |
| 25.000 23.5(47) 25.000 27.72 25.000 26.000 26.000 26.000 27.72 28.000 | 25.000 25.607 26.000 | 000 | 23,540 | 24 000 | 427 | | |
| 35,647 25,000 4,000 25,000 4,000 25, | 25,000 26,772 26,000 26,000 26,000 26,000 26,000 26,000 26,000 27,000 28,000 | 000 | 31,527 | 2000 | 787 | | |
| 2,000 2, | 26,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 38,000 38,000 39,000 31,000 31,000 32,000 33,000 34,000 35,000 36,000 37,000 38,000 | 000 | 35.467 | 000,62 | 1000 | | |
| 25,000 26,667 28,000 | 25,000 26,667 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 38,000 39,000 31,000 31,000 31,000 32,000 32,000 33,000 34,000 34,000 35,000 36,000 37,000 38,000 | 000 | 0 070 | 26,000 | 10:1 | | - |
| 7 2 000 8 2 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 | 7 2000 82 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 | 000 | 2/2/0 | 27.000 | 476 | | |
| 2, 000, 52 1, 200 2, 000 2, 000 2, 000 2, 000 2, 000 2, 000 3, 000 3, 000 3, 000 4, 000 4, 000 4, 000 6, 000 7, 000 8, 000 1, | 7 29,000 7 28,000 7 29,000 7 29,000 7 29,000 7 31,000 7 31,000 7 32,000 7 33,000 7 34,000 7 35,000 7 35,0 | 000 | 26,/67 | 000 00 | 852 | | |
| 26 | (43) 30,000 (5) 31,000 (7) 4, 32,000 (7) 4, | 000 | 6,667 | 000,03 | 22 | | |
| 30,000 26, 31,000 26, 32,000 27, 32,000 28, 33,000 28, 33,000 29, 33,000 20, 32,000 20, 32,000 | 284 30,000 284 32,000 14 35,000 14 35,000 14 35,000 17 35,000 18 35,000 18 35,000 18 35,000 18 35,000 18 35,000 | 33 | 683 | 29,000 | 778 | | |
| 284 31,000 18 284 32,000 28 32,000 28 34,000 2 | 264 31,000 16 36 32,000 2 36,000 2 37 34,000 2 4 35,000 2 4 35,000 2 7 3 4,000 2 7 3 5,000 2 7 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 | 000 | | 30.000 | | | |
| 284 32,000 38,000 55 33,000 74 34,000 75 35,000 76 35,000 77 78,000 78 78,000 78 78,000 78 78,000 | 284 32,000 35,000 14 35,000 14 35,000 14 35,000 14 35,000 14 35,000 17 35,000 17 35,000 | 000 | 1,305 | 31 000 | 22 | | |
| 36 32,000 27 34,000 27 35, | 36 32,000 37 34,000 77 35,000 6 35,000 7 4 35,000 | 000 | 284 | 000,10 | 79/ | | |
| 33,000 14 35,000 4 35,000 7 2 2 | 33,000 14 35,000 6 35,000 6 35,000 7 2 2 | 000 | 36 | 32,000 | 0 | | |
| 34,000 14 35,000 4 5,000 7 7 8,000 | 34,000 (4 35,000 6 36,000 | 000 | 200 | 33.000 | | | |
| * S S S S S S S S S S S S S S S S S S S | * S * Z - C | 000 | 5.5 | 24 000 | 12 | | |
| 2 - C | - 4 e | 000 | 14 | 34,000 | tr. | | |
| 2 2 2 - | 3> ~ ~ < | 000 | - | 35,000 | | | |
| 50- | 5N-C | 000 | 9 | 36.000 | - | | |
| 2 0000 | 2 0000 | 000 | * | | 0 | | |
| | 900 | 3 | 2 | | | | |
| | 000 | 3 | _ | | | | |

TABLE B-44 SPECTRUM BS1.DSL2 (NO. 44)

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| Pange (ps1) n R Pange (ps1) n Pange (ps1) | New | DISTRIBUTION | c | ř | 900 | 0007 | 000 | 000 | 101 | 23.1 | 201 | 123 | | 26 | 2 67 | | 7 | 88 | 30 | 235 | 200 | 3,677 | 13.0% | 12,277 | 7, 27, | 2 | | 11,663 | - | | | | | _ | _ | | | | | | _ | | _ |
|--|--|--------------|-------------|---|------|------|-------|-------|-------|--------|-------|--------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|
| LINE TRANSPORT | Range (ps.1) Ra | | R | | -1.5 | -1.2 | -1.0- | -6 | -8- | -1 | - 9 | - 5 | - 4 | 3- | -2.5 | | 0 | - | 2 | | 4 | -5- | 9. | .7- | 8. | -6. | 1.0- | : | 1 | 1 | 1 | 1 | | | | | | | | | | | |
| RAVIGE DISTRIL RAVIGE DISTRIL 1,000 2,000 4,000 6,000 10,000 11,000 12,000 12,000 13,000 12,000 12,000 12,000 12,000 12,000 12,000 12,000 12,000 12,000 12,000 12,000 12,000 12,000 12,000 12,000 12,000 13,0 | RAMIGE Paring Par | SULION | u | | | | | - | 7663 | 21.295 | 9 423 | 2700 | 6,113 | 7,617 | 900 | 200 | 34 | 6 | 14 | 12 | 0 | - 0 | 000 | 177 | 900 | 1177 | 1,041 | 241 | 10 | - | 400 | 1 | 0 | | | | | | | | T | - | |
| | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | Range (psi) | | | - | 1,000 | 2,000 | 3,000 | 4,000 | 2,000 | 0000,9 | 7,000 | 8,000 | 000.6 | 10,000 | 11.000 | 12.000 | 13.000 | 14.000 | 15,000 | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 21,000 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 | 000,82 | 000,62 | 30,000 | 31,000 | 32,000 | 33,000 | 34,000 | 35,000 | | |

TABLE B-45 SPECTRUM BS3.DSL2 (NO. 45)

DESCRIPTION: SPECTRUM NO. 3 STRESSES DECREASED 10 PERCENT.

| FLIGHT HOURS | 11 | 2,500 | FLIGHTS = 5,112 | LANDINGS | = 5,112 |
|------------------------|----|-------------|----------------------------|------------------------|-----------|
| TOTAL CYCLES | 11 | 649,353 | AVERAGE NO. OF CYCLES PER: | FLIGHT | = 127. |
| RANGE TRUNCATION (PSI) | H | 4,000 (0.9) | | FLIGHT HOUR = | = 259.7 |
| HIGHEST PEAK (PSI) | 11 | 22,130 | SMALLES | MALLEST VALLEY (PSI) = | = -14,12, |

| UTION R DISTRIBUTION | n R | -1.5 | - | 1.50 | -1.0 /,963 | | 8:- | 7 | 9:- | | 4 - | | | | 269 16 | 857 | | " | | 7 | | 9. | | 8. | 6. | 1.0 | | 1887 | 824 | 43 | 12 | | 0 | | | | | | | | | | |
|----------------------|-------------|---------|---------|---------|------------|--------|--------|--------|--------|--------|--------|--------|--------|-----|--------|-----|--------|-------|-------|--------|--------|--------|--------|--------|---------|---------|---------|---------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----|--------|--------|
| RANGE DISTRIBUTION | Range (psi) | | | 1 000 | 200 | 000,5 | 3,000 | 4,000 | 5,000 | 000.9 | 7,000 | 000 | 000 | 000 | 000 | 000 | 000,21 | 3,000 | 000 | 000,51 | 16,000 | 000,71 | 000,81 | 19,000 | 20,000 | 21,000 | 22,000 | 23,000 | 24,000 | 000,52 | 7000,02 | 000,72 | 000,00 | 000,67 | 30,000 | 31,000 | 32,000 | 33,000 | 34,000 | 35,000 | | 1 | |
| SUTION | c | | | | 0 | 33 | 7 | | 2000 | 2,104 | 4,878 | 6,754 | 10,547 | 206 | 0 | • | | | > | 0 | 480 | 0 | 29 | 2 | 144,802 | 147,691 | 162,108 | 129,621 | 30,661 | 2,633 | 4,487 | 1,020 | 217 | 38 | /3 | 2 | 0 | , | | | | | |
| PEAK DISTRIBUTION | Peak (psi) | -12,000 | -11,000 | -10 000 | 000 | 000.6- | -8,000 | 000.7- | -6,000 | -5.000 | -4.000 | -3 000 | 2000 | 000 | 000. | 000 | 000 | 2,000 | 3,000 | 000,4 | 000,5 | 000.0 | 000,7 | 8,000 | 000,6 | 000,01 | 000,11 | 12,000 | 3,000 | 000,41 | 000.61 | 000 | 000 | 000,01 | 000.61 | 000,02 | 21,000 | 22,000 | 23,000 | 24,000 | 000 | 000,02 | 26,000 |

TABLE B-46 SPECTRUM BS4.DSL2 (NO. 46)

| 4 STRESSES DECREASED 10 PERCENT | |
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FLIGHTS = 3.111 LANDINGS = 15.872

AVERAGE NO. OF CYCLES PER: FLIGHT = 64.0

FLIGHT HOUR = 79.6

SMALLEST VALLEY (PSI) = -25.185

FLIGHT HOURS = 2,500

TOTAL CYCLES = 199,036

RANGE TRUNCATION (PSI) = 4,000 (0.9)

HIGHEST PEAK (PSI) = 25.957

| 1,000 | | NOTION INTO | WANTE DISTALBULION | 101100 | V 013 | NOT LOCK TOTAL |
|--|------------|-------------|--------------------|--------|-------|----------------|
| 1,000 34,235 1,000 1,0 | Peak (psi) | c | | c | æ | - |
| 1,000 2,000 34,235 3,000 34,427 35,000 34,427 35,000 34,427 35,000 34,427 35,000 37,668 37,668 37,668 37,668 37,668 37,668 37,668 37,668 37,668 37,678 | Ī | | | | | |
| 1,000 34,235 -1.5 | -12 000 | | | | - | 292 |
| 1,000 2,000 3, | 000 | | | | 0.0 | 2.176 |
| 2,000 2,000 3, | 000 | | 000 | | 7.1- | 57/17 |
| 1000 | 0000 | | 000,1 | | -1.0 | 4174 |
| 3,000 3,000 4,000 5,000 1, | -8,000 | | 7,000 | (| 6 | 0 7/7 |
| 1,000 1,00 | -8,000 | | 3,000 | | 8 | 7, 10 |
| \$\begin{array}{c c c c c c c c c c c c c c c c c c c | -7.000 | | 4.000 | 34,235 | - 7 - | 1221 |
| \$\(\frac{\(\carcex{\\carcex{\carcex{\(\carcex{\(\carcex{\(\carcex{\(\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\carcex{\\carcex{\\carcex{\\carcex{\\carcex{\\cinck{\\carcex{\\carcex{\\cinck{\cinck{\ciiinta\cinck{\cinck{\cinck{\cinck{\cinck{\cinck{\cinck{\cinck{\cii | -6.000 | | 5 000 | 78,197 | ,, | |
| 4,56,6 7,000 7,772 -,4572 -,4472 <td>5 000</td> <td>0</td> <td>2006</td> <td>41,421</td> <td>9</td> <td>2/9</td> | 5 000 | 0 | 2006 | 41,421 | 9 | 2/9 |
| 1,000 2,025 1,000 2,025 1,000 2,025 1,000 2,025 1,000 2,025 1,000 2,025 1,000 2,025 1,000 2,025 1,000 2,025 1,000 2,026 1,000 2,00 | 000 | 6,568 | 000,0 | 14.772 | · | 693 |
| 1,000 2,92 2,92 2,000 2,92 2,92 2,92 2,93 | 000 | 31.639 | 000, | 0000 | 4 | 341 |
| 1,000 2,75 1,00 | -3,000 | 3 9/3 | 8,000 | 0107 | 3 | 140 |
| 10,000 5/3 10,000 5/3 10,000 10,000 5/3 10,000 12,000 13,000 12,000 13,000 1 | -2,000 | | 000 6 | 2,725 | - 2 | 434 |
| 1,000 | -1.000 | 248 | 10,000 | 6/3 | !- | 308 |
| 1,000 22/1 1 | 0 | 6 | 000 | 152 | | 623 |
| 1,000 | 000 | 0 | 2000 | 221 | 0. | 502 |
| 13,000 1,5 1 | 000 | 0 | 12,000 | 125 | - | 040 |
| 4,000 80 | 7,000 | 0 | 13,000 | 2 | .2 | 000 |
| 15,000 60 15 15 15 15 15 15 15 1 | 3,000 | 0,0 | 14,000 | (1) | 3 | 133 |
| 1,000 76 55 57 57 5 | 4.000 | 067 | 15,000 | 80 | | 3,240 |
| 2.5 6,286 17,000 492 | 2,000 | 4,712 | 16,000 | /9 | • | 25,574 |
| 1,000 492 1,000 492 1,000 4,000 1,000 | 000 | 0 | 000 | 78 | 0. | 59.546 |
| 6,362 18,000 3,766 18 | 000,1 | 235 | 000,71 | 492 | 9. | 44 815 |
| 33,776 19,000 5,766 19 | | 6,382 | 18,000 | 3 788 | 1 | 1,363 |
| 10 10 10 10 10 10 10 10 | | 33.778 | 19,000 | 2000 | 8. | |
| 1,000 | | 20 598 | 20,000 | 200 | 6. | 0 |
| 1,4,4,5 | 1 | 2000 | 21.000 | 1,/33 | 10 | 0 |
| 29 298 23,000 29 298 24,000 3,570 25,000 4,000 25 20,000 52 30,000 22 20,000 24,000 27 28 30,000 28 30,000 29 31,000 29 31,000 29 32,000 20 33,000 20 33,000 20 33,000 20 33,000 20 32,000 20 32 | 11,000 | 74,446 | 22 000 | 1,390 | 2 | 42,376 |
| 29,298 2,700 3,576 25,000 2,570 1,443 1,443 2,000 | | 19,720 | 2000 | 188 | | |
| 1,726 24,000 3,576 26,000 26, | | 86262 | 23,000 | 73 | | |
| 2,570 4,443 4,443 7,000 4,401 7,000 7,000 7,000 7,4 1,000 8,000 8,000 1,00 | | 9.176 | 24,000 | 20 | | |
| 26,000 401 270 280 108 108 108 108 108 108 108 1 | 14,000 | 9 570 | 75,000 | 14 | | |
| 27,000 28,000 28,000 28,000 29,000 24,000 24,33,000 24,000 25,33,000 26,33,000 27,33,000 27,33,000 28,000 29,000 | 15,000 | 1443 | 26,000 | 1 | | - |
| 2 2 2 2 3 1000 2 3 1000 2 3 1000 2 3 3 3 1000 2 3 3 3 1000 2 3 1000 2 3 3 1000 2 3 10 | 16,000 | | 27,000 | 0 | | |
| 25 30,000 82,000 83,000 84,000 74 83,000 84,000 75 84,000 75 84,000 75 85 87,000 75 87 87,000 87 87 87 87 87 87 87 87 87 87 87 87 87 | 17,000 | 101 | 28,000 | 0 | | |
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| 25 33,000 34,000 6 34,000 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 | 19 000 | 108 | 2000 | 00 | | |
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| 20000 | 000,02 | 24 | 31,000 | | | |
| (0 N N N O | 71,000 | 14 | 32,000 | | | |
| - 10 10 10 10 | 22,000 | 0 | 33,000 | | | |
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| | 25,000 | 2 | 000*55 | | | |
| | 27,000 | 2 | | | | |
| | 2000 | 0 | | | | |
| | 2,000 | | | | | |
| | 1 | I | 1 | | | |

TABLE B-47 SPECTRUM BS6.DSL2 (NO. 47)

DESCRIPTION: SPECTRUM NO. 6 STRESSES DECREASED 10 PERCENT.

| FLIGHT HOURS | | 2,500 | FLIGHTS = 2,422 | - TANDINGS | 3,843 |
|--------------------------|---|-------------|-----------------------------------|-------------------------|--------|
| TOTAL CYCLES | | 181,644 | AVERAGE NO. OF CYCLES PER: FLIGHT | | = 75.0 |
| RANGE TRUNCATION (PSI) = | | 4,000 (0.9) | | HOUR | 72.7 |
| HIGHEST PEAK (PCI) | - | 21,531 | SMALLEST | SMALLEST VALLEY (PSI) = | 21,868 |

| | (PS1) N Range (PS1) N Ra | | DISTRIBUTION |
|--|--|------|--------------|
| 1,000 1,00 | 1,000 2 3,000 2 4,000 2 4,000 2 3,000 2 4,000 2 2,00 | | c |
| 1000 | 1,000 2 3,000 3,000 | | 772 |
| 1,000 | 1,000 2,000 3,4/49 3,5/400 3,4/49 3,4/400 3,4/49 3,4/400 3,4/49 3,4/400 3,4/49 | 0.5 | 869 |
| 1000 | 194 2 1,000 2 1,000 2 1,000 2 2,000 | 7:1- | 529 |
| 4 6 6 6 6 6 6 6 6 6 | 9 3,000 9,5 4,404 13,404 13,000 13,000 13,000 13,000 13,000 14,003 15,000 16,000 17,000 18,000 18,000 18,000 19,000 19,000 19,000 19,000 19,000 19,000 19,000 19,000 10 | - | 869 |
| 10 10 10 10 10 10 10 10 | 1000 | | 490 |
| 199 5,000 77,727 1,000 7,000 1,000 | 1999 1999 1990 | 191 | 439 |
| 1000 29,027 1000 29,027 1000 2,049 2,049 2 | 9/5 5,000 2 2,474 7,000 2 2,474 8,000 2 2,4748 8,000 2 2,4748 8,000 2 1,000 2 2 2,4748 18,000 2 2,000 2 2,4748 18,000 2 2,4748 18,000 2 3,4748 2,500 2 3,000 2 2,500 2 3,000 2 2,500 2 3,000 2 2,500 2 3,000 2 2,500 2 3,000 2 2,500 2 3,000 2 2,500 2 3,000 2 2,500 2 3,000 2 2,500 2 3,000 2 2,500 2 3,000 2 2,500 2 3,000 2 2,500 2 3,000 2 2,500 2 3,000 2 2,500 2 3,000 2 2,500 2 3,000 2 3,000 2 2,500 2 3,000 2 | | 333 |
| 3,4/4 3,000 3,4/4 3,00 | 2,4/4, 2,4/4, 2,4/4, 2,4/4, 2,4/4, 2,000 2,000 2,4/4, 10,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 12,000 13,000 13,000 14,000 15,000 16,000 17,002 18,000 18,000 19,000 | | 197 |
| 1,000 3,004 3 | 1000 2,498 1,000 2,498 1,000 1,000 | | 92 |
| 1,000 284 -1.3 | 2 4498 777 777 777 777 777 768 847,88 847,88 847,88 1987 | | 58 |
| 1000 286 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.1 1.0 1.0 1.1 1.0 | 77 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | | 64 |
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| 1,000 1,00 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | · | 79 |
| 1,000 1,00 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | Т | 6// |
| 3,000 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | Т | 243 |
| 4,000 | 46 646 646 646 7,7372 34,7483 34,7483 34,7483 34,7483 34,7483 34,7483 34,7483 34,7483 34,7483 34,7483 34,7483 36,7483 7,77 7,77 7,910 7,051 7,051 7,051 7,051 7,051 7,051 7,0051 7, | Т | 707 |
| 15,000 37 16,000 37 17,000 37 17,000 37 17,000 37 17,000 37, | 0 0 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | T | 200 |
| 1,000 37 1,5 1,000 1,5 1,5 1,000 1,5 | 446 4/183 4/183 4/183 33,149 33,149 33,149 33,149 33,149 33,149 31,584 1,055 1,05 | T | 3,733 |
| 1,000 1,00 | 94 100 100 100 100 100 100 100 10 | 1 | 16,125 |
| 1,000 1,25 1, 1,000 1,25 1, 1,000 1,237 1, 1,000 | 109 4/163 17,372 37,763 34,763 35,344 35,344 35,344 35,344 36,052 1,0 | | 52,775 |
| 19,000 544 19,000 19,000 13,0 | 4,163 13,172 13,172 13,176 13,176 13,176 13,176 1,051 | | 89,731 |
| 1,000 1,00 | 34,783 34,783 35,784 35,784 37,77 7,77 25,02 25,02 26,02 27, | | 639 |
| 33,783 20,000 4,131 33,476 22,000 33c 1.0 1.0 1.3 1.3 1.5 1.0 1.0 1.3 1.5 1.0 1.0 1.3 1.5 1.0 1.0 1.3 1.5 1.0 1.0 1.3 1.5 1.0 1.0 1.0 1.3 1.5 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 34,763 34,149 35,149 35,786 77 77 77 77 77 77 77 77 70 8 | | 0 |
| 33/49 22,000 32¢ 1.0 | 33,181 31,582 31,582 1,0 | | 0 |
| 35.38/ 35.38/ 37.78/ 25.000 | 00 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | 13,446 |
| 3, 9, 6, 6, 7, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10 | 3/3/8/ 100/2 1 | 34 | |
| 7.7 29,000 7.651 26,000 7.652 27,000 7.7 29,000 7.7 29,000 7.7 29,000 7.7 39,000 7.8 30,000 7.9 31,000 7.9 31,000 7. | 7,717 7,77 7,77 7,77 7,77 7,77 7,77 7,7 | 364 | |
| 7, 29,000 7,092 7,000 25,000 28,000 7, 29,000 7, 29,000 8,000 8,000 9, | 1,051 1,092 250 77 77 77 77 77 70 25 25 25 10 10 10 10 10 10 10 10 10 10 10 10 10 | 180 | |
| 26,000 250 27,000 28,000 7,000 7,000 1 | 280// 250// 27// 20// 20// 20// 20// 20// 20// 2 | 28 | |
| 25.000 25.000 27,000 20,000 31,000 6 31,000 7 33,000 6 34,000 7 33,000 7 33,000 8 31,000 9 34,000 | 255 | 1 | |
| 28,000 77 28,000 8 31,000 7 23,000 9 34,000 9 35,000 9 35,000 | 2900000 | | |
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| 27,000 | 27,000 | | |
| 27,000 | 26,000,32 | | |
| | 27,000 | | |
| | | | |

FLIGHTS = 2.422 LANDINGS = 3.843. AVERAGE NO. OF CYCLES PER: FLIGHT = 75.0 FLIGHT HOUR = 72.7 SMALLEST VALLEY (FSI) = -17.981 DESCRIPTION: SPECTRUM NO. 6 STRESSES DECREASED 26 PERCENT. FLIGHT HOURS = 2.500 TOTAL CYCLES = 181.644 RANGE TRUNCATION (PSI) = 4.000 (0.74) HIGHEST PEAK (PSI) = 17.703

TABLE B-48 SPECTRUM BS6.DSL3 (NO. 48)

| 1,000 | (psi) | (Psi) C Pange (Psi) D D | FEAR DISTRIBUTION | 301108 | KANGE DISTRIBUTION | BUI 104 | K DIS | DISTRIBUTION |
|--|---|--|-------------------|--------|--------------------|---------|-------|--------------|
| 1,000 | 1,000 | 1,000 1,377 1,000 1,37 | Peak (psi) | C | Pange (psi) | c | CC | c |
| 7 2 2,000 | 7 2000 | 7 2 2 0000 | | | | | | - |
| 1,000 1,22,61/ 2,000 2,2,61/ 4,000 2,2,64/ 4,000 2,2,64/ 4,000 2,2,64/ 5,000 2,2,64/ 6,000 2,2,64/ 6,000 2,2,64/ 1,000 2,2,64/ 1,000 2,2,64/ 1,000 2,2,64/ 1,000 2,2,64/ 1,000 2,4,7/ 1,000 2,4/ 1,000 2, | 7 7 3,000 (22,8%) -1.2 -1.2 -1.2 -1.2 -1.2 -1.2 -1.2 -1.2 | 7 2 2,000 (22,264) (3,000 (22, | | | | | | 277 |
| 1,000 | 1,000 | 1,000 2, | 12,000 | | | | 0.5 | 86% |
| 1,000 | 1,000 | 1,000 1,377 3,000 7,37 | 000'11 | | | | 7.1- | 555 |
| 2,000 | 100 | 2,000 1,3,7 7,000 2,3,7 4,000 2,3,6,4 4,3,4,6 6,000 2,2,9,5 7,000 2,2,9,6 7,000 2,2,000 2,2,6 7,000 2,2,000 2,2,000 2,2,6 7,000 2,2,00 | -10,000 | | 000 | | 0.1- | 9/0 |
| 7. 2000 | 7 3,000 | 1,000 1,00 | -9.000 | | 2.000 | | 6 | 000 |
| 100 | 100 | 1000 | OUO 8 | 47 | 3 000 | 1,317 | 0 | 440 |
| 20/ 6,000 2,3ev 7,348 8,000 9,2ee 7,348 8,000 9,2ee 7,349 8,000 9,7 10,000 6,00 11,000 6,00 12,000 9,2ee 11,000 6,00 12,000 9,2ee 12,000 9,2ee 13,000 9,2ee 13,000 9,2ee 14,000 6,00 13,000 9,2ee 14,000 9,2ee 15,000 9,2ee 16,000 9,2ee 17,000 9,2ee 18,000 9,000 9,00 13,000 9,000 9,000 9,000 9,00 13,000 9,000 9,000 9,000 9,00 13,000 9,000 9,000 9,000 9,00 13,000 9,000 9,000 9,000 9,000 9,00 13,000 9,000 9,000 9,000 9,000 9,00 13,000 9,000 9,000 9,000 9,000 9,000 9,00 13,000 9,000 | 20/ 4/5 4 6,000 | 20/1 5,000 21,35°4 4,100 21,35°4 4,146 8,000 9,796 7,100 7,196 7,100 7,196 1,100 7,29 1,100 7,29 1,100 7,29 1,100 7,29 1,247 1,000 24 1,247 1,000 24 1,247 1,000 24 1,25° 1,000 24 1,26° 2,000 26 1,26° 2,000 28 1,26° 2,000 28 1,26° 2,000 28 1,26° 2,000 28 1,26° 2,000 28 1,26° 2,000 28 1,26° 2,000 28 1,26° 2,000 28 1,26° 2,000 38 1,000 33,000 1,26° | 0000 | 2 | 000 | 132.811 | | 43% |
| 20 5,000 7,386 4,346 8,000 9,386 2,91 10,000 6,0 2,91 10,000 6,0 1,000 6,0 1,000 6,0 1,000 6,0 1,000 6,0 1,000 6,0 1,000 6,0 1,000 6,0 1,000 6,0 1,000 7,386 1,000 7,447 1,000 7,477 1,000 7, | 100 | 20 5,000 2,295 7,000 2,295 2,295 2,295 2,295 2,295 2,295 2,295 2,295 2,295 2,295 | 000./- | 7 | 4,000 | 31304 | 1: | 233 |
| 7,346 7,346 7,346 7,000 7,346 7,000 7, | 7.5 | 4/3 | 9,000 | 201 | 5,000 | 1000 | 9:- | 100 |
| 1,000 2,29 \(\frac{4}{4} \) | 100 | 100 2.295 3.000 | -5.000 | 103 | 000 | 7,360 | 1 | 141 |
| # 4.346 # 5.346 # 5.300 # 5.000 # 5 | 4,346 7,000 445 -1.3 | #346 8,000 445 2 1,000 60 2 11,000 60 11,000 60 12,000 77 13,000 77 14,000 74 74 15,000 74 74 15,000 74 74 15,000 74 74 15,000 74 74 15,000 74 74 15,000 74 74 15,000 74 74 15,000 74 74 15,000 74 75 13,000 74 76 15,000 74 77 17 17 77 18,000 75 78 18,000 75 78 18,000 75 78 18,000 75 78 18,000 75 78 18 18 18 18 78 18 18 18 18 78 18 18 18 18 78 18 18 18 18 78 18 18 18 78 18 18 18 18 78 18 18 18 18 78 18 18 18 18 78 18 18 18 18 78 18 18 18 18 78 18 18 18 18 78 18 18 18 18 78 18 18 18 18 18 78 18 18 18 78 18 18 18 18 78 18 18 78 18 18 18 78 18 18 18 78 18 18 18 78 18 18 18 78 18 18 18 78 18 18 18 78 18 18 18 78 18 18 18 78 18 18 18 78 18 18 1 | 000 | 4/15 | 2000 | 2,295 | | 26 |
| 1,000 27 -2.3 -2.5 - | 1,000 27 -2.3 -2.5 - | 1, 2, 2, 3, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, | 000 | 4.348 | 000,0 | 445 | * . | 90 |
| 1,000 60 1,000 | 1000 60 100 | 1,000 60 1,000 60 1,000 60 60 60 60 60 60 60 | -3,000 | W 233 | 8,000 | 100 | -:- | 101 |
| 10,000 23 10,000 23 10,000 23 10,000 23 10,000 24 23 10,000 24 24 24 24 24 24 24 | 10,000 23 10 10 10 10 10 10 10 1 | 10,000 23 10,000 23 10,000 23 10,000 23 10,000 24 24 24 24 24 24 24 | -2.000 | | 000.6 | | | 4 |
| 1,000 23 0 0 0 0 0 0 0 0 0 | 1,000 23 0 0 0 0 0 0 0 0 0 | 2 11,000 23 0 13,000 4c 13,000 77 14,000 24/6 94 16,000 24/6 6,247 17,000 24/6 15,000 24/7 16,000 24/7 17,000 24/7 17,000 24/7 18,000 24/7 19,000 24/7 10,000 25/6 25,000 25/6 26,64/8 21,000 25/6 27,000 25/6 27,000 25/6 28,000 25/6 29,000 25/6 29,000 25/6 29,000 25/6 20,000 25/6 20, | 1 000 | 341 | 10 000 | 09 | - | 63 |
| 1,000 | 1,000 72 1,000 73 1,0 | 1,000 72 15,000 72 15,000 72 15,000 774 15,000 774 15,000 774 15,000 774 15,000 774 17,000 774 17,000 774 18,000 774 18,000 774 18,000 774 18,000 774 18,000 72 72 73,000 72 73,000 74 74 75 75 75,000 75 75 75 75 75 75 75 | 000 | 23 | 000 | 23 | - " | 79 |
| 12,000 | 12,000 | 12,000 4C 13,000 4C 13,000 4C 14,000 24 4C 15,000 25 25,000 25,000 | 0 | | 000. | c | 0 | 011 |
| 13,000 | 13,000 | 13,000 742 15,000 774 15,000 774 15,000 774 15,000 774 15,000 774 15,000 774 17,000 744 17,000 744 17,000 744 17,000 744 18,000 744 18,000 774 18,000 774 18,000 774 774 775 7 | 1.000 | | 12,000 | 7/ | | 111 |
| 1,000 24E | 1,000 | 1,000 24 6 6 6 6 6 6 6 6 6 | 0000 | 0 | 12 000 | 40 | | 243 |
| 14,000 24E 3 15,000 25E | 14,000 24E .4 .4 .4 .4 .4 .4 .4 | 14,000 24 6 6 6 6 6 6 6 6 6 | 7,000 | 0 | 13,000 | 77 | 7. | 793 |
| 15,000 275 275 2 | 15,000 275 15,000 275 247 15,000 275 247 15,000 275 25,000 2 | 15,000 379 3 | 3,000 | 242 | 14,000 | 2000 | | 2016 |
| 1,000 1,417 1,5 | 1,000 1,417 1,5 | 1,000 1,00 | 4 000 | 7+1 | 15,000 | 242 | 4 | 3,100 |
| 1,000 | 1,000 | 1,000 1,4/7 1,000 1,4/7 1,000 1,4/7 1,000 1,00 | 000 | 94 | 000 | 979 | | 16,125 |
| 17,000 | 17,000 | 1,000 494 1,000 494 1,000 494 1,000 56 1,000 56 1,000 56 1,000 1,0 | 000.6 | 747 | 000.91 | 1417 | c. | 52.775 |
| 18,000 50 18 18 18 18 18 18 18 1 | 18,000 50 18 18 18 18 18 18 18 1 | 18,000 5/8 18,0 | 000.9 | 13 447 | 17,000 | 101 | 9. | 00 12 |
| 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 26 20 20 20 20 20 | 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 100 26 25 25 25 25 25 25 25 | 1,000 36/1 1,000 36/1 1,000 36/1 1,000 36/1 1,000 36/1 1,000 36/1 1,000 36/1 1,000 372 25,000 25/100 26/100 | 7.000 | 1440 | 18,000 | 4/4 | 1 | 01, 10 |
| 22,766 15,000 36,1 10 10 10 10 10 10 10 10 10 10 10 10 10 | 22,766 15,000 36,1 1.9 1.9 1.0 1.9 1.0 1.9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 22,766 20,000 36,1 26,6/8 21,000 777 32,000 72 6,67 23,000 5 7,67 23,000 5 7,700 5 7,000 5 7,000 7 7,000 7 7,000 7 8,000 7 7,000 7 8,000 7 8,000 7 7,000 7 8,000 7 8,000 7 9,000 7 13,000 7 14,000 7 14,000 7 15,000 7 17,000 7 18,000 7 | 000 | 41,580 | 000 | 200 | | 839 |
| 28,678 22,000 777 1.9 7.5 22,000 22 7.0 23,000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 26,6/8 20,000 177 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 | 20,000 177 32,662 21,000 62 1,500 52 21,000 65 21,000 65 21,0 | 8,000 | 32.768 | 000.61 | 381 | 0 | 0 |
| 21,000 27, 1.0 2,637 23,000 5 1,576 24,000 6 3,5000 6 28,000 7, 1.0 28,000 7, 1.0 29,000 7, 1.0 31,000 7 | 21,000 27 6,697 23,000 25 6,697 23,000 6 7,77 24,000 6 7,800 6 7,900 7 7,900 7 7,900 7 7,900 7 7,900 7 7,900 7 8,000 7 7,900 7 8,000 7 9,000 7 11,000 7 13,000 7 13,000 7 13,000 7 13,000 7 14,000 7 15,000 7 16,000 7 17,000 7 18,000 7 19,000 7 | 21,000 22 2,697 23,000 5 6,697 23,000 6 7,4 27,000 6 7,4 27,000 75,000 6 7,4 27,000 75,0 | 000.6 | 2//26 | 20,000 | 121 | 6. | |
| 32,000 22 25,000 25 25,000 25 25,000 25 25,000 25 25,000 25 25,000 | 32, CE2 22, 000 25 22, 000 25 23, 000 25 23, 000 25 24, 000 25 25, 000 25 25, 000 25 25, 000 2 | 32,672 32,673 3,000 5,000 5,000 6,000 7,4 7,4 7,000 8,000 1,00 | 10.000 | 0/2/07 | 21.000 | | 1 5 | 2 |
| 2, 697 2, 000 2, 500 2, 000 2, 000 2, 000 2, 000 2, 000 2, 000 2, 000 3, 000 | 2, 697 1, 570 1, 570 24,000 56 28,000 7, 7, 7, 0,00 7, 0,00 7, 0,00 7, 0,00 7, 0,00 7, 0,00 7, 0,00 11,000 13,000 13,000 14,000 15,000 16,000 17,000 18,000 19,00 | 7, 23, 500 1, 576 2, 600 3, 200 2, 600 3, 200 3, 600 3, | 000 | 32,062 | 000 | 22 | 2 | 13,446 |
| 23,000 372 372 25,000 74 74 27,000 74 28,000 7,00 | 23,000 27,500 26,000 26,000 26,000 7,4 27,000 7,4 28,000 7,000 | 7, 57,6 37,7 5,6 5,6 5,6 7,7 7,7 7,7 7,7 7,7 7,7 7,7 7 | 000 | 6.697 | 000.22 | 5 | | |
| 24,000 56 56 57,000 56 57,000 57,000 57,000 57,000 58 | 24,000 56 56 57,000 28,000 28,000 74 28,000 74 29,000 31,000 31,000 31,000 32,000 33,000 35,000 35,000 | 24,000 56 56 57,000 27,000 28,000 29,000 31,000 31,000 31,000 32,000 33,000 35,000 35,000 | 12,000 | | 23,360 | | | |
| 2/E 2/E 2/E | 2/E 9/5 9/5 | 2/E 9/5 9/5 | 13,000 | 1,510 | 24 000 | ٥ | | |
| 8 7 8 - 0 | 99 7 90 - 0 | 80 7 80 - 0 | 000 | 3/2 | 2000 | | | |
| 30-0 | ¥ 0 - 0 | ¥ 0 - 0 | 000 | 98 | 000,67 | | | _ |
| (w) ~ 0 | | . w - 0 | 000.51 | 77 | 7000 | | | |
| 0 - 0 | 0 - 0 | 10 - 0 | 16.000 | | 27.000 | | | |
| -0 | -0 | -0 | 17 000 | 0 | 000 00 | | | |
| 0 | 0 | 0 | 000 | , | 000.07 | - | | |
| 2 | 2 | 2 | 18,000 | | 29,000 | | | |
| | | | 19,000 | 2 | 20 000 OF | | | |
| | | | 000 | | 000 | | | |
| | | | 20,000 | | 31,000 | | | |
| | | | 21.000 | - | 32.000 | 1 | | |
| | | | 22 000 | | 22 000 | | | |
| | | | 22,000 | | 33,000 | | | |
| | | | 23,000 | I | 34,000 | | | |
| | | | 24 600 | | 35 000 | | | |
| 27,000 | 27,000 | 2,000 27,000 27,000 | 000 | | 000.00 | | | _ |
| 27,000 | 27,000 | 27,000 | 000,62 | | | | | |
| 27,000,72 | 27,000 | 27,000 | 25,000 | I | | | | |
| | | | 27,000 | | | | | |
| | | | | | | | | |
| | | | | | | | | |

TABLE B-49 SPECTRUM BS6.DSL4 (NO. 49)

TABLE B-50 SPECTRUM BS1.VPC1 (NO. 50) DESCRIPTION: SPECTRUM NO. 1 WITH DIFFERENT VALLEY/PEAK COUPLING

FLIGHTS = 2,528 LANDINGS = 2,528
AVERAGE NO. OF CYCLES PER: FLIGHT = 16.8
FLIGHT HOUR = 17.0
SMALLEST VALLEY (FSI) = -24,298

FLIGHT HOURS = 2,500

TOTAL CYCLES = 42,463

RANGE TRUNCATION (PSI) = 4,000

HIGHEST PEAK (PSI) = 22,114

SPECI KOM BS6.DSL+ (NO. +7)

DESCRIPTION: SPECTRUM NO. 6 STRESSES INCREASED 35 PERCENT.

| HOLIBS | н | 2.500 | FLIGHTS = 2,422 LANDINGS = | LANDINGS | 11 | 3,843 |
|--|----|--------------|----------------------------|-------------------------|-----|---------|
| COTAL CVCIES | # | 181.644 | AVERAGE NO. OF CYCLES PER: | FLIGHT | н | 75.0 |
| DANICE TRINCATION (PSI) = 4.000 (1.35) | 11 | 4.000 (1.35) | | FLIGHT HOUR = | R = | 72.7 |
| MAINGE INCINCALIDATE | - | 17 297 | | SMALLEST VALLEY (PSI) = | = (| -32,802 |

| eak (psi) | | | | | - |
|-----------|---------|-------------|---------|------|--------|
| 000 | r | Pange (psi) | c | æ | c |
| 000 | 7.5 | | | ! | 277 |
| | 9 | | | 5 | 869 |
| -11,000 | 201 | | | 7.1- | 529 |
| -10,000 | 0 | 000, | | | 698 |
| -0,000 | 4/6 | 7,000 | | 200 | 067 |
| -8,000 | 30 | 3,000 | | 0 | 459 |
| 000 | 3,295 | 4,000 | 0 | | 333 |
| -6,000 | 3.378 | 2,000 | 58,161 | 0. | 161 |
| -2,000 | 4690 | 000,0 | 73, 166 | | 26 |
| -4,000 | 7/3 | 000.7 | 9.656 | 4. | 35 |
| 000 | 72 | 3,000 | 23 972 | 2. | 65 |
| -2,000 | 7 | 000.6 | 4877 | 7:- | 63 |
| 000 | | 10,000 | 2005 | 7 | 79 |
| 0 | | 11,000 | 76// | 0 | 611 |
| 0000 | | 12,000 | 601 | - | 243 |
| 2,000 | | 13,000 | 229 | .2 | 793 |
| 3.000 | 1 | 14,000 | 1 | .3 | 21.0 |
| 4.000 | * | 15,000 | 10 | 7 | 0011 |
| 000 | 0 | 16,000 | 14 | 100 | 16,163 |
| 000 | 96 | 000 | 27 | | 54.775 |
| 0,000 | 570 | 000,71 | 56 | 0,1 | 89,731 |
| 7,000 | 136 | 000,81 | 22 | | 839 |
| 8,000 | 76 | 19,000 | 1/2 | 2. | 0 |
| 0000.6 | 5 | 20,000 | 80 | 7. | 0 |
| 000 | 156 | 21,000 | 7 | 0. | 13,446 |
| 11,000 | 4036 | 22,000 | 9 | | |
| 000 | 10000 | 23,000 - | 3 ! | | |
| 000 | 2 | 24,000 | 50 | | |
| 000 | 1,757 | 25,000 | 00 | | |
| 000 | 33,674 | 26,000 | 10 | | |
| 000 | 31,128 | 27.000 | 0 | | |
| 000 | 4,7/2 | 28.000 | 2/2 | | |
| 000 | 32,690 | 000 | 205 | | |
| 000 | 8083 | 000,67 | 805 | | |
| 000 | 25.691 | 30,000 | 940 | | |
| 000 | 4,720 | 31,000 | 363 | | |
| 000 | 722 | 32,000 | 301 | | |
| 22.000 | 1001 | 33,000 | 3. | | |
| 23.000 | 11.2.76 | 34,000 | 250 | | |
| 24 000 | .25 | 35,000 | 748 | | |
| 000 | 246 | 200.55 | 9 | | |
| 200,62 | 30 | 2000 | 683 | | - |
| 050'9 | 57 | 90000 | 201 | | |
| 27,000- | 26 | 38,000 | 23 | | |
| 32,000 | | 29,000 | ar | | _ |
| 33,000 | I | 42,000 | | | |

| 000 | 1,000 | PEAK DISTRIBUTION eak (DSi) n | RANGE DISTRIBUTION | DUTION | R DIST | DISTRIBUTION |
|--|--|----------------------------------|--------------------|--------|--------|--------------|
| 1,000 2,000 | 1,000 2,000 | | | | 4 | 1 |
| 1,000 2,000 2,000 2,000 2,349 2,000 | 1,000 1,00 | | | | U ~ | 63 |
| 1,000 2,000 3,000 3,000 4,000 3,200 4,000 3,200 4,000 3,200 4,020 2,200 1,000 2,000 1,000 2,000 1,000 2,000 1,000 2,000 1,000 2,000 1,000 | 1,000 2,000 3,000 4,000 2,000 4,000 3,249 1,250 1,000 1,429 1,200 2,100 1,432 1,000 1,432 1,000 1,254 1,000 | | | | | 1,089 |
| 2,000 2,000 4,000 2, | 2,000 4,000 6,000 7,000 6,000 7,000 6,000 7,000 6,000 7,000 6,000 7,000 6,000 7,000 7,000 7,000 7,000 7,000 10,000 | | 1 000 | | | 29 |
| 1,000 2,00 | 1,000 2,00 | | 2,000 | | 200 | 48 |
| 4,000 4,000 5,296 5,000 5,206 6,000 | 4,000 4,000 4,000 1,296 7,000 1,200 1,200 1,400 1,000 1,400 1,000 1,400 1,000 1,400 1,000 1,400 1,000 1,400 1,000 | | 3 000 | | | 50 |
| 1000 12,000 13, | 1000 12,249 1.5 1100 | | 000 | O | 0. | 789 |
| 1000 | 1000 | | 000, | 15.989 | | 2/2 |
| 1,000 1,00 | 1,000 1,00 | 0 | 000,00 | 3,349 | 0.1 | 369 |
| 1000 4/32 1.3 1. | 10 10 10 10 10 10 10 10 | 5,639 | 0,000 | 13.00 | | 84 |
| 1,000 1,422 1,000 1,422 1,000 1,422 1,000 1,422 1,000 1,422 1,000 1,422 1,000 1,20 | 1,000 1,422 1,000 1,422 1,000 1,422 1,000 1,422 1,000 1,422 1,000 1,422 1,000 1,227 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,00 | | 000, | 4939 | 4 | 52 |
| 1,000 1,00 | 1,000 1,00 | | 8,000 | 1 423 | 3 | |
| 10,000 652 10,000 12,0 | 10,000 652 10,000 12,0 | 1. | 000.6 | 77-11 | 2 | |
| 1,000 25 1,000 1,000 25 1,000 1,000 25 1,000 25 1,000 25 1,000 25 1,000 25 2,000 2,000 25 2,000 | 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 1,000 32 32 1,000 32 32 32 32 32 32 32 | 11 | 10,000 | 289 | - | 44 |
| 1,000 32/ 1,000 | 1,000 32/ 1,000 | 0 | 11,000 | 52 | | 7 |
| 13,000 | 13,000 | Y | 000,11 | 165 | | 93 |
| 13,000 73 15,000 15,00 | 13,000 73 15,000 73 15,000 73 15,000 74 15,000 75 | - | 12,000 | | - | 72 |
| 14,000 2 3 3 4 6 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | 14,000 26 15 16 16 16 16 16 16 1 | - | 13,000 | 130 | 2 | 200 |
| 15,000 26 16,000 26 16,000 26 16,000 26 16,000 26 16,000 26 16,000 26 25 27 27 27 27 27 27 27 | 15,000 26 15,000 26 15,000 26 15,000 26 15,000 26 15,000 26 15,000 26 25 25 25 25 25 25 25 | - | 14,000 | 2 | 2 | 000 |
| 1,000 26 15 16 10 10 10 10 10 10 10 | 1,000 26 15 16 10 16 10 16 10 16 10 10 | > | 000 | 2 | ? • | 767 |
| 10,000 1 | 10,000 1 | C | 000.61 | 26 | 4. | 2.503 |
| 17,000 25 25 25 25 25 25 25 | 17,000 22 18,000 25 19,000 25 25 25,000 25 25,000 25, | 499 | 000,91 | 3 | 5. | 14 470 |
| 18,000 2.56 1, | 18,000 258 1, | | 17,000 | | 9. | 0,0 |
| 775 2000 258 1, 10 | 775 258 19,000 2 568 19,000 2 568 19,000 2 568 19,000 19,000 2 568 19,000 19,00 | 0 | 18 000 | 25 | 1 | 6,011 |
| 10 10 10 10 10 10 10 10 | 10 10 10 10 10 10 10 10 | 0 | 000 | 258 | | 1,172 |
| 777 2 20,000 374 1.9 6.683 22,000 1/,356 1.0 72,000 1/,356 1.0 72,000 6.2 73,000 6.2 73,000 6.2 7,000 6.2 | 7775 20,000 374 1.9 20,000 1/356 1.0 21,000 1/356 1.0 23.000 62 24,000 62 25,000 6 27,7 28,000 6 28,000 6 31,000 6 4,8 31,000 6 32,000 6 4,8 31,000 6 31,000 6 31,000 6 31,000 7 4,8 31,000 6 32,000 7 4,8 31,000 6 32,000 7 4,8 31,000 6 32,000 7 4,8 31,000 7 4,8 31,000 7 4,8 31,000 7 4,8 31,000 8 4,000 8 35,000 | | 000,61 | 18 | 0.0 | 0 |
| 21,000 1,356 1.0 1.0 1.2.0 1.3 | 21,000 1,356 1.0 1.0 1.2 2.3 2.0 4/8 2.3 2.0 4/8 2.3 2.0 4/8 2.3 2.0 4/8 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 | 2775 | 000,02 | 314 | · . | 0 |
| 22,000 4/8 23.000 6.2 2.00 | 12,000 1 | 2876 | 21,000 | 136 | 1.0 | 1 |
| 100 | 23.005 24.000 26.000 27.7 27.7 27.7 27.000 27.7 27.000 27.7 27.000 27.7 27.000 27.7 27.000 27.7 27.000 27.7 27.000 27.7 27.000 27.7 27.000 27.7 27.000 27.7 27.000 27.7 27.000 28 | 2007 | 22,000 | | | 1 |
| 2326 24,000 334 25,000 27,7 27,000 28,000 28,000 28,000 28,000 4,33,000 1,33,000 1,34,000 35,000 35,000 | 23.2 24,000 23.4 25,000 25.000 27.7 27,000 28,000 28,000 28,000 28,000 28,000 4,4 31,000 1,33,000 1,34,000 35,000 35,000 | 1.130 | 23,000 | 8/4 | | |
| 76-4 25,000 27.7 27,000 27.7 27,000 27.7 27,000 28,000 28 30,000 4 31,000 7 33,000 7 33,000 7 33,000 1 34,000 35,000 35,000 1 34,000 1 35,000 | 25,000 27,7 27,7 27,000 27,000 27,000 27,000 27,000 27,000 27,000 28,000 4,33,000 4,33,000 1,34,000 38,000 38,000 38,000 1,34,000 | 1,330 | 000 | 693 | | |
| 23.34 25.500 27.7 27.7 27.000 27.7 27.000 27.00 | 23.000 2 | 10.964 | 000,47 | 14 | | |
| 25,000 28,000 28,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 | 25,000 28,000 39,000 31,000 32,000 38,000 38,000 38,000 38,000 | 525 2 | 72,000 | 0 | 2 | |
| 27,000 28,000 30,000 31,000 31,000 31,000 31,000 31,000 31,000 | 27,000 28,000 30,000 31,000 33,000 34,000 | 1 2/2 | 26,000 | 2 | | |
| 28,000 30,000 31,000 32,000 33,000 34,000 35,000 | 28,000 29,000 30,000 31,000 31,000 35,000 35,000 | 200 | 27,000 | | | |
| 29,000 31,000 32,000 34,000 35,000 | 29,000 31,0000 32,000 33,000 34,000 35,000 | 200 | 28,000 | | | |
| 33,000 | 33,000 | 163 | 29,000 | 1 | | |
| | | 28 | 000000 | 0 | | |
| | | 7. | 000,00 | | | _ |
| | | 7 | 31,000 | | | |
| | ППППП | | 32,000 | | | |
| 35,000 | 34,000 | , | 32,000 | | | |
| 35,000 | 35,000 | , | 200,00 | | | |
| 35,000 | 35,000 | | 34,000 | | | |
| | | | 35.000 | | | |
| | | | | | | |
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| | | | | | | |
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| | | | | | | |

TABLE B-51 SPECTRUM BS2.VPC1 (NO. 51)

| | = 437 = 20.2 1= 3.5 |
|---|---|
| ING | LES PER: FLIGHT = 20.2 FLIGHT HOUR = 3.5 SMALLEST VALLEY DESL: -17.878 |
| DESCRIPTION: SPECTRUM NO. 2 WITH DIFFERENT VALLEY/PEAK COUPLING | FLIGHTS = 437 AVERAGE NO. OF CYCLES PER: FLIGHT FLIGHT SMALL FST VALLEY |
| 10. 2 WITH | 2.500 8.842 4.000 17.915 |
| Z Z | |
| DESCRIPTION: SPECTRU | FLIGHT HOURS TOTAL CYCLES RANGE TRUNCATION (PSI) = HIGHEST PEAK (PSI) = |

| -12, 2002 -10, 1000 -10, 1 | (psi) | PEAK DISTRIBUTION | TIG. | RANGE DISTRIBUTION | LTION I | R DISTR | DISTRIBUTION |
|--|--|-------------------|-------|--------------------|---------|---------|--------------|
| 1,000 2, | 1,000 2,000 2,000 2,000 2,642 2,000 2,642 2,000 2,642 2,000 2,642 2,000 2,642 2,000 2,642 11,000 12,000 13,000 13,000 13,000 14,000 15,000 16,000 17,000 18,00 | M | c. | | · | cε | c |
| 1,000 1,00 | 1,000 2,000 2,000 2,000 2,000 3, | + | | | T | | |
| 1,000 | 1,000 2, | -12,000 | | 1 | | -1.5 | - 0 |
| 1,000 2,442 2,460 | 1,000 2,460 2,460 1,000 1, | -11,000 | | | | -1.2 | 000 |
| \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}}{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}}{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}}{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}}{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\frac{\cappa_{\end{array}}\$ \$\cappa_{\e | 24 5,000 | -10.000 | T | 1,000 | | -1.0 | 20 |
| 1000 | 1000 | 000 | | 2 000 | | 0 | 211 |
| 1000 | 1000 | 000 | O | 2000 | | | 21 |
| 24 | 24 5,000 2,643 - 5 5 0,000 2,643 - 5 5 0,000 2,643 - 5 5 0,000 2,643 - 5 5 0,000 2,643 - 5 5 0,000 2,643 - 5 5 0,000 2,643 - 5 5 0,000 2,643 - 5 5 0,000 2,643 - 5 5 0,000 2,643 - 5 5 0,000 2,643 - 5 5 0,000 2,643 - 5 5 0,000 2,644 - 5 0,000 2,644 - | 000 | 183 | 000.5 | U | 0. | 0 |
| 1000 | 1000 2,542 2,500 2,542 2,500 2,542 2,500 2,542 2,500 2,542 2,500 2,542 2,500 2,542 2,500 2,542 | -1,000 | 20 | 4,000 | 4184 | 1 | 4 |
| 1,000 2,53 1,000 2,0 | 6,000 | -6,000 | | 2,000 | 21.43 | 9:- | - |
| 1,000 2,52 2,000 2,52 2,000 | 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 1,000 2,52 2,00 | -5.000 | 7 | 0000.9 | 20,00 | 5 | + |
| 1,000 2,52 2,000 2,52 1,00 | 1,000 2,523 3,000 1,000 4,2 3,000 4,2 3,000 4,2 3,000 4, | 4.000 | 0 | 7,000 | 367 | - 4 | |
| 2 9,000 462 1.1 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 1,000 42 1,000 42 1,000 1, | 2 000 | 913 | 8 000 | 253 | 1 | - |
| 1,000 42 1,000 | 10,000 42 11,000 77 13,000 77 14,000 77 15,000 77 16,000 77 17,000 77 18,000 77 | 000 | 2 | 000 | 808 | | 0 |
| 10,000 12,000 13,000 13,000 14,000 16,000 16,000 16,000 17,000 18,000 18,000 19,000 10,000 | 10,000 | 2000 | 0 | 000.6 | 42 | 7:- | , |
| 11,000 | 11,000 | 000.1- | | 000.00 | 11 | 7 | 2 |
| 12,000 13,000 14,000 15,000 16,000 16,000 17,000 18,000 18,000 19,000 10,000 | 12,000 75 13,000 13,000 13,000 14,000 15,000 16,00 | 100 | - | 11.000 | | 0 | 1 |
| 15,000 | 13,000 | 1 000 | | 12 000 | 00 | | 13 |
| 13,000 14,000 15,000 16,000 16,000 17,000 18,000 19,000 19,000 19,000 19,000 10,000 | 13,000 16,000 16,000 16,000 17,000 18,000 19,000 20,000 | 000 | | 12,000 | 3/ | - ' | 15 |
| 14,000 | 14,000 | 2,000 | I | 13,000 | | .2 | 201 |
| 15,000 16,000 18,000 18,000 19,000 19,000 19,000 19,000 19,000 19,000 10,000 | 15,000 | 3.000 | I | 14.000 | 7 | 7 | 50/ |
| 1,000 1,00 | 1,000 1,00 | 000 | | 000 | L) | | 462 |
| 16,000 18,000 18,000 18,000 19,000 19,000 10,000 | 16,000 | 4,000 | | 000,61 | 0 | 4. | 757 |
| 17,000 | 17,000 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 2,000 | I | 16,000 | - | 5: | 2000 |
| 18,000 1,187 19,000 1,187 19,000 22,000 23,000 1,078 24,000 25,000 25,000 26,000 27,000 28,000 29,000 31,000 60,000 73 29,000 73 29,000 73 73 73 74 75 75 76 76 77 78 79 79 79 79 79 79 79 79 79 79 | 18,000 | 000.9 | | 17.000 | | 9 | 2110 |
| 1, 2 1, 1, 2 1, 2 1, 2 1, 2 1, 2 2 1, 2 2 2 2 2 2 2 2 2 | 1,1/87 | 2,000 | | 18 000 | - | 7 | 1,940 |
| 7, 1000 0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 20,000 0 1.0 6.67 21,000 0 1.0 6.68 23,000 0 0 1.0 7.000 25,000 0 0 1.0 7.000 25,000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 000 | _ | 000 | ' ' | | 65 |
| 7, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | 20,000 0 1.9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 8,000 | 0 | 19,000 | 0 | 0. | 0 |
| 21,000 2,605 2,000 2 | 21,000 22,000 23,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 3,000 | 0000.6 | 1.187 | 20,000 | 0 | 7. | C |
| 7,460 2,496 2,496 1,078 2,100 2,20 2,000 3,0 | 22,000 00 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 000.00 | 100 | 21.000 | | 1.0 | 1 696 |
| 7, 20, 20, 10, 20, 20, 20, 20, 20, 20, 20, 20, 20, 2 | 7,000,000,000,000,000,000,000,000,000,0 | 11 000 | 600 | 22 000 | 0 | | 1,363 |
| 25.49c, 24,000 111 1,078 25,000 25 25,000 2 23,000 1 23,000 2 27 28,000 2 37 31,000 6 31,000 6 31,000 7 31,000 7 31,000 8 31,000 7 31,000 8 31,000 8 31,000 9 31,000 34,000 9 32,000 34,000 9 | 25.4% 1,078 25,000 25,000 25,000 25,000 26,000 27,000 28,000 31,000 | 2000 | 1,609 | 000,22 | 0 | | |
| 24,000 27,2 26,000 27,2 26,000 28,000 28,000 29,000 31 | 24,000 27,2 26,000 34,000 2,000 2,000 2,000 2,000 3,000 | 12,000 | 2000 | 23,300 | 111 | | |
| 25,000 34,000 27,000 28,000 29,000 31,000 | 25,000 34,000 31,000 | 13.000 | 2117 | 24.000 | - | 1 | |
| 27.2 27.3 28.000 28.000 28.000 29.000 37.000 37.000 37.000 37.000 37.000 37.000 37.000 37.000 37.000 37.000 37.000 37.000 37.000 37.000 | 27.2 27.2 28.000 28.000 29.000 29.000 31 | 14 000 | 0/0/ | 25,000 | 22 | 1 | |
| 23,000,000 | 23,000,000 | 000 | 2/3 | 000 | , | | |
| 23.000 28.000 29.000 31.000 31.000 33.000 34.000 35.000 35.000 36.000 37.000 | 23.000 23.000 23.000 31.000 33.000 34.000 34.000 35.000 36.000 37.000 | 000.61 | 39 | 20,000 | 0 | | |
| 28,000 29,000 31,000 | 28,000 29,000 31,000 | 16,000 | " | 7,000 | | | |
| 29,000 31,000 31,000 33,000 34,000 34,000 35,000 35,000 | 29,000 31,000 31,000 33,000 34,000 35,000 | 17.000 | 2 | 28,000 | | | |
| 31,000 31,000 32,000 33,000 35,000 35,000 | 31,000 31,000 31,000 31,000 31,000 31,000 31,000 | 1000 | 7 | 29 000 | 10 | | |
| 31,000 32,000 33,000 34,000 35,000 | 31,000 32,000 33,000 34,000 35,000 | 000 | 0 | 500.63 | 6 | | |
| 31,000 33,000 34,000 35,000 35,000 | 31,000 32,000 33,000 34,000 35,000 | 13,000 | | 30,000 | | | |
| 32,000 33,000 34,000 35,000 | 32,000 33,000 34,000 35,000 | 20,000 | I | 31,000 | 1 | | |
| 33,000 0 34,000 0 35,000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 33,000 0 34,000 0 35,000 | 21 000 | - | 32 04.0 | - | | |
| 34,000 | 35,000 | 000 | | 000 | , | | |
| 35,000 | 35,000 | 77,000 | | 33,000 | 0 | | |
| 35,000 | 35,000 | 23,000 | | 34,000 | | | |
| | | 24 000 | | 35 000 | | | |
| | | 000 | | 200.00 | - | | |
| | | 000.62 | | | | | |
| 27.000 | 27,000 | 26.000 | | 1 | | | |
| | | 27,000 | | 1 | | | |
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| | The state of the s | | | | | | |

TABLE B-52 SPECTRUM BS3.VPC1 (NO. 52)

DESCRIPTION: SPECTRUM NO. 3 WITH DIFFERENT VALLEY/PEAK COUPLING

FLIGHTS = 5.112 LANDINGS = 5.112
AVERAGE NO. OF CYCLES PER: FLIGHT = 76.0
FLIGHT HOUR = 155.5
SMALLEST VALLEY (PSI) = -15.692

FLIGHT HOURS = 2.500

TOTAL CYCLES = 388.719

RANGE TRUNCATION (PSI) = 4.000

HIGHEST PEAK (PSI) = 24.588

| 1,000 | 1,000 1,10 | 000 | 101100111 | 200 | PIST NEDO LIGH |
|---|--|--|-----------|------|----------------|
| 1,000 | 1,000 | 200 200 200 200 200 200 200 200 | | æ | c |
| 1,000 1,000 1,000 2,000 2,000 2,000 1,000 | 1,000 | 296 296 206 206 206 206 206 206 206 20 | | | |
| 1,000 | 1,000 | 208 | | | 21 |
| 1,000 | 1,000 | 200 100 | | | 17 |
| 1000 110,000 | 1000 1,000 | 266 266 266 266 266 266 266 266 266 266 | | 7.1- | 07 |
| 1,000 1,00 | 100 | 2.386 2. | | 0 | 1770 |
| 4,000 4,000 6,400 6,500 6,000 1,000 6,400 6,000 1,000 6,400 6,000 1,000 6,100 6,000 1,000 6,10 | 4 4 6 6 6 000 6 4 6 6 6 0 0 | 298 | | 6:- | 1 |
| 4,000 4,40 6,60 6,60 6,00 6,60 6,00 | 4,000 170,626 1.5,000 1.5,00 | \$607 \$607 \$7362 \$7362 \$7362 \$7362 \$746 \$717 \$717 \$717 \$717 \$717 \$717 \$717 \$71 | | 8 | 249 |
| 1,000 1,00 | 1.00 | 298 20 20 20 20 20 20 20 2 | - | 7 | 2,208 |
| C C C C C C C C C C | C C C C C C C C C C | 296 6,660 6,666 6,666 6,666 6,666 6,666 1,273 1,274 1,27 | + | | . 406 |
| 1,000 1,50 | 1,000 1,00 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | 2 | 42 |
| 1,000 41,250 1.0 | 1,4,6,6,6 1,000 1,1,2,5,6 1,000 1,2,5,6 1,000 1,2,5,6 1,000 | 2.367 2.367 2.367 2.26 2.66 2.66 2.67 2.67 2.67 2.67 2. | - | | C |
| 1000 25.55 3,000 25.587 -1.3 -1. | 1,000 26,567 3,000 26,567 3,000 26,567 3,000 36,67 3,000 3 | 2.98.2 2.98 2.98 2.94 | | 4:- | a |
| 1,000 22,587 1,000 1,316 1,000 1,000 1,316 1,0 | 1,000 22,587 1,000 1,0 | 200 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | - | | 000 |
| 10,000 | 10,000 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 30 | 2 | |
| 11,000 6,027 1,000 1,0 | 11,000 6,027 1,000 1,0 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 1 | 1 | 00 |
| 1,000 1,00 | 12,000 13,000 1 | 4 60 0 4 60 0 0 4 60 0 0 0 0 0 0 0 0 0 0 | | | 24 |
| 13,000 | 13,000 | 442,242 144,800 15,774 15,774 15,774 15,774 15,774 15,774 15,774 16,074 16,074 16,074 17,074 17,074 18,004 | | | 334 |
| 1,000 736 73 | 1,000 73¢ 1,000 1,000 73¢ 1,000 73¢ 1,000 73¢ 1,000 73¢ 1,000 1,000 73¢ 1,000 73¢ 1,000 73¢ 1,000 73¢ 1,000 1,000 73¢ 1,000 73¢ 1,000 73¢ 1,000 73¢ 1,000 1,000 73¢ 1,000 73¢ 1,000 73¢ 1,000 73¢ 1,000 1,000 73¢ 1,000 73¢ 1,000 73¢ 1,000 73¢ 1,000 | 460 460 460 460 460 460 460 460 460 460 | | - 0 | 939 |
| 1,000 1,51 1,000 1,51 1,000 1,51 1,000 1,51 1,000 1,51 1,000 1,51 1,000 1,51 1,000 1,51 1,000 1,51 1,000 1,51 1,000 1,51 1,000 1,51 1,000 1,51 1,000 1,51 1,000 1,51 | 1,000 1,00 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | 7. | 3,620 |
| 1000 12 12 12 12 12 12 1 | 1000 151 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | 7 | 14. 04.8 |
| 16,000 151 1.0 1 | 16,000 151 1.0 1 | 460 460 600 600 600 600 600 600 | - | 4. | (11.17 |
| 17,000 52 17,000 53 17,000 17,000 53 17,000 53 17,000 53 17,000 53 17,000 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 17,000 53 17,000 53 17,000 53 17,000 53 17,000 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 53 17,000 17,000 53 17,000 53 17,000 53 17,000 53 17,000 | 1,000 52 1,000 52 1,000 1, | 486 164,227 164,227 164,227 164,227 164,227 164,227 16,277 16, | | 15: | 910 010 |
| 18,000 5 6 6 6 6 6 6 6 6 6 | 18,000 5 1 1 1 1 1 1 1 1 1 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | 9. | 010 '607 |
| 19,000 44 .9 .9 .9 .9 .9 .9 .9 | 19,000 44 | 26 142 145 1 | - | 1 | 6, 000 |
| 142 24 20,100 1,312 1,00 1,312 1,00 1,312 1,00 1,312 1,00 1,312 1,00 1,312 1,00 1,312 1,00 1,312 1,00 1,312 1,00 1,312 1,00 1,312 1,00 1,211 1,00 1,211 1,00 1, | 1.0 1.44 1.0 1.44 1.0 1.0 1.45 1.0 1.45 1.0 1.45 1.0 1.45 1.0 1.45 1.0 1.2 1.0 1.2 1.2 1.0 1.2 1.2 1.0 1.2 | 0 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | : 0 | 1.941 |
| 142 21,000 1,312 1.0 1,46 1.0 1,46 1.0 1,312 1.0 1 | 142 21,000 1,312 1.0 1,46 1.0 1,46 1.0 1,312 1.0 1 | 146,231 146,231 121,779 121,77 | | 0.0 | 0 |
| 142 1312 1 | 142 1312 1 | 142 146,227 42,242 42,242 13,774 13,774 13,774 6,074 6,074 6,074 186 186 186 186 186 186 186 186 | | 5. | 0 |
| 12, 227 23, 000 22, 24, 27, 27, 27, 27, 27, 27, 27, 27, 27, 27 | 144,227 22,1000 1,211 | 15.74 15.774 15.774 17.74 17.74 18.6 18.6 18.6 18.6 18.6 19.1 19.1 10.1 | | 0. | 20 000 |
| 23,000 15,777 15,779 25,387 26,000 25,387 26,000 27,387 27,000 27,387 28,000 814,000 186 186 186 186 186 186 186 186 | 23,000 12,779 12,779 25,000 25,347 26,000 27,000 37,000 37,000 814 81,000 186 186 186 186 186 186 186 186 | 42,292 12,4180 12,4180 12,4180 25,347 6,74 186 186 186 12,13 12,13 13,13 14 186 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18 | - | | 2017 |
| 25,000 1.12,179 25,000 1.7.2 25,000 1.7.3 25 | 25,000 1.27.1480 25,000 1.7.2 25,000 1.7.2 25,000 1.7.2 25,000 1.7.2 25,000 1.7.2 25,000 1.8.2 2 | 15.77 15.77 15.77 18.6 18.6 18.6 18.6 18.6 18.6 18.6 19.7 10. | | | |
| 25,000 25,347 25,347 25,347 26,000 36,000 | 25,000 26,347 27,000 26,347 28,000 28,000 28,000 28,000 28,000 36,000 36,000 36,000 36,000 37,000 36,000 37,000 | 25,347 6,076 1,08 1,08 1,08 1,08 1,08 1,08 1,08 1,08 | - | | |
| 25,347 27,485 27,000 36,000 | 25,34480 26,000 27,4480 27,000 27,000 28,000 28,000 28,000 29,000 38,000 38,000 38,000 18,000 2,000 38,000 18,000 2,000 3,000 18,000 | 25347 674 80 86 4 186 38 38 38 | | | |
| 000 15 27 27 000 25 27 000 | 000, 55 1 21, 000 1 8 91, 000 1 90, 000 1 90, 000 1 1, 000 1 1, 000 1 1, 000 1 2, 000 1 3, 000 1 1, 000 1 2, 000 1 3, 000 1 3, 000 1 4, 000 1 5, 000 1 7, 000 1 8, 000 1 9, 000 1 1, 000 1 | 22 22 22 22 23 23 23 23 25 25 25 25 25 25 25 25 25 25 25 25 25 | - | | |
| 000, 85 000, 85 000 | 000, 62 1 000, 62 1 000, 63 1 | 1016 86 4 353 1016 1016 1016 1016 1016 1016 1016 101 | | | |
| 353 186 186 186 186 1800 1800 1800 1900 | 353 86 186 186 31,000 186 31,000 187 197 197 197 197 197 197 197 19 | 353 186 186 18 17 12 12 12 12 12 14 16 16 16 16 16 16 16 16 16 16 16 16 16 | | | |
| 96 4 30,000 186 31,000 3,000 1 3,000 1 3,000 | 96 4 30,000 186 31,000 36,000 1 36,000 1 37,000 1 37,000 1 37,000 1 37,000 1 37,000 1 37,000 | 981 186 186 27 21 2 | | | |
| 000,482 000 | 186 3,000 1 2 3,000 1 2 3,000 1 2 3,000 1 2 3,000 | 38 - 5 - 0 | | | |
| 36 31,000 31,000 1 33,000 2 34,000 2 34,000 | 36 31,000 31,000 12 33,000 12 34,000 2 35,000 | 38 - 27 - 0 | - | | |
| 33,000 12 33,000 12 34,000 13,000 | 32,000 1 33,000 1 34,000 1 34,000 1 34,000 | 2-2-0 | | | |
| 20-0 | -22-0 | 5 2 - 0 | | | |
| 22-0 | 2 × × | 2~-0 | | | |
| ~-0 | 2-0 | N-0 | I | | |
| -0 | -0 | -0 | | | |
| | | | | | |
| 27,000 | 27,000 | 2000 | | | |
| 27,000 | 27,000 | 27.00010 | | | |
| | | 000',4 | | | |
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TABLE B-53 SPECTRUM BS4.VPCI (NO. 53)

| FLIGHT HOURS | | 11 | 2,500 | FLIGHTS = 3,111 | LANDINGS | GS | 15,872 |
|--------------------------|-----|----|---------|------------------------------|---------------|-------|---------------------------------|
| TOTAL CYCLES | | 11 | 199,348 | AVERAGE NO. OF CYCLES PER: F | FLIGHT | | - 64.1 |
| RANGE TRUNCATION (PSI) = | (IS | 11 | 4,000 | | FLIGHT HOUR = | HOUR | 7.67 |
| HIGHEST PEAK (PSI) | | И | 28.841 | SMALLEST | ST VALLE | (PSI) | SMALLEST VALLEY (PSI) = -27,983 |

| 1,000 | PEAK DISTRIBUTION | - | RAMGE DISTRIBUTION | 5UT I ON | R DIST | DISTRIBUTION |
|--|-------------------|-------|--------------------|----------|--------|--------------|
| 1,000 | 1 1 | U | Pange (psi) | Ľ | cc | c |
| 1,000 | | | | | | |
| 1,000 | | | | | | 767 |
| 1,000 | -12,000 | | | | | 2,182 |
| 1,000 | -11,000 | T | | | 7:1- | T-097 |
| 2,000 15,700 15,700 1,700 1,700 1,700 2,700 1,700 2,700 1,700 2,700 1,700 2,700 1,700 2,700 1,700 2,700 1,700 2,700 1,700 2,700 1,810 2,100 | -10,000 | T | 1,000 | | 0.1- | 4 233 |
| 3,000 | -000 | T | 2,000 | | 6 | |
| 15.7cc | 0000 | | 3 000 | | 8 | 2.130 |
| Section Sect | 000 | | 000 | 0 | - 7 - | 1, 100 |
| 5,000 | 000.7- | T | 4,000 | 86.356 | | 1,639 |
| 15,70c 5,000 45,066 -2,5 -2,000 -2,406 -2,000 -2,0 | -6,000 | | 2,000 | 20 520 | 0 | 209 |
| 24, 762 2, 100 12, 227 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 100 1, 1758 1, 1 | | | 000,9 | 43.061 | 5 | 05.8 |
| 24/362 8,000 11,758 -3 -3 -3 -3 -3 -3 -3 - | + | 00 | 7.000 | | 4 | |
| 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | 24, | 305 | 000 8 | 12,221 | - 3 | 360 |
| 779 0,000 2,027 1,000 | 2, | 350 | 000 | 11,758 | - 2 | 438 |
| 1,000 | -2,000 | 79 | 000,6 | 2,027 | 7 | 304 |
| 1,000 742 1 1,000 742 1 1,000 742 1 1,000 742 1 1,000 742 1 1,000 742 1 1,000 742 1 1,000 742 1,000 742 1,000 742 1,000 742 1,000 742 1,000 743 1,000 743 1,000 743 1,000 743 1,000 743 1,000 743 1,000 743 1,000 743 1,000 7,000 | 000.1- | v | 000,01 | 417 | | 628 |
| 12,000 2.53 2. 1. 1. 2. 2. 1. 2. 2. | 0 | | 11,000 | 742 | 0 | 617 |
| 3,000 2,44 3, 2 1,000 1,12 3, 4,4 1,000 1,12 3, 4,5 1,000 1,12 3, 4,5 1,000 1,12 3, 4,5 1,000 | 000 | 0 | 12,000 | 1 | - | 000 |
| 1,000 1,00 | 2 000 | 0 | 13 000 | 653 | 2 | 275 |
| 3,476 1,000 1,12 1,2 | 2,000 | 0 | 000 | 244 | | 857 |
| 3,476 15,000 177 5,4 19, | 3,000 | C | 14,000 | 112 | ? . | 2,821 |
| 1,000 120 15 | 0 | 121 | 15,000 | 11 | 4. | 19.65 |
| 1,000 1,00 | 2 | 91+ | 16.000 | | .5 | 100 |
| S | | 105 | 17,000 | 02 | 9 | 27/10 |
| 0 | 0000 | 0 | 000 | 27 | 5 - | 19,778 |
| 3,704 19,000 371 1.0 | 000. | 0 | 000.01 | 66 | | 1,737 |
| 51,615 1,000 3,161 1,00 43 1,000 | - | 704 | 13,000 | 571 | 0.0 | 0 |
| 10 10 10 10 10 10 10 10 | - | 20.00 | 70,000 | 3.161 | 5. | 0 |
| 15.281 22,000 3,344 15.281 24,000 1,610 | 1 | 100 | 21,000 | 1 201 | 0. | 43036 |
| 15.78 23,000 4,358 24,000 1,458 25,000 1,458 2,400 1,458 2 | 1 | 101 | 22.000 | 2779 | | |
| 24,358 24,000 25,000 66,54 27,286 25,000 25,000 27,286 27,286 27,379 27,000 27,379 27,000 27, | | 182 | 000.00 | 3,344 | | |
| 27,260 26,54 2,541 2,541 2,641 2,641 2,641 2,000 2,100 3,100 3,200 4,2 3,100 3,100 3,100 6,100 1,1 | | 358 | 000.52 | 0.00 | | |
| 25,000 5,379 5,379 2,641 2,641 2,640 2,641 2,000 3,000 1 | - | 280 | 74,000 | 90% | | |
| 2.541 25,000 25, | 1 | 1 | 25,000 | 30 | | |
| 2 2 31 7 27,000 793 793 793 793 793 793 793 793 793 793 | + | 500 | 26,000 | | | |
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| 743 29,000 211 21,000 42 32,000 42 32,000 62 42 32,000 62 62 62 62 62 62 62 62 62 62 62 62 62 | 2. | 140 | 000 80 | | | |
| 316 30,000 106 31,000 106 32,000 42 33,000 11 35,000 8 8,000 8 8,000 1 35,000 | 000.71 | 793 | 000.02 | 1 2/ | | |
| 211 31,000 42 13,000 64 42 13,000 65 13 13,000 65 13 13,000 65 15,600 65 15, | 000,8 | 316 | 000,62 | 9 | | |
| 1000 1000 1000 1000 1000 1000 1000 100 | 000,61 | 211 | 30,000 | 000 | | |
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| 33 34 000 11 35,000 8 35,600 | 21.000 | 100 | 32,000 | Q. | | _ |
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TABLE B-54 SPECTRUM BS5.VPC1 (NO. 54)

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| SPECTRUM NO |
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| RIP |
| DESCRIPTION |
| |

FLIGHTS = 3.205

AVERAGE NO. OF CYCLES PER: FLIGHT = 71.5

FLIGHT HOUR = 91.6

SMALLEST VALLEY (PSI) = -14.897

FLIGHT HOURS = 2.500
TOTAL CYCLES = 228,996
RANGE TRUNCATION (PSI) = 4.000
HIGHEST PEAK (PSI) = 20,664

| 1,000 | (F24) | 0 | | c | æ | c |
|---|--------|---|--|---------|------|----------|
| 1,000 2,000 3,000 3,000 3,000 4,264 6,597 6,000 4,000 1,000 | | 0 9 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | | | | |
| 1,000 1,00 | | 0 9 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | | | | |
| 1,000 2,000 3,000 3,000 4,264 5,547 6,000 4,000 1,004 1,000 1,000 | | 0 | The second secon | | | 1,734 |
| 1,000 2,000 2,000 2,000 2,000 3,000 1,000 | | 0 | | | 2 | 724 |
| 1,000 15,450 1,000 1,0 | | 0 | | | 7:1- | 187 |
| 2,000 4,000 4,000 4,000 4,000 4,000 4,000 1, | | 0 | 1,000 | | -1.0 | |
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| 13 15 15 15 15 15 15 15 | -3,000 | - | 7,000 | 794.9 | 4 | 3 |
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| 10,000 | -1,000 | - | 3,000 | 2.510 | 7:- | (3 |
| 1,000 16 17 17 17 17 17 17 17 | 0 | I | 10,000 | 100 | - | 42 |
| 12,000 16 | | 1 | 11,000 | 101 | 0 | 3 6 |
| 13,000 16 15 15 15 15 15 15 15 | 000 | | 12 000 | 90 | _ | 7 |
| 1,000 10 10 10 10 10 10 | 000. | | 000 | 186 | | 743 |
| 14,000 47 15,000 16,00 | 7,000 | | 13,000 | 0/ | 7. | 2,913 |
| 15,000 16 15 15 15 15 15 15 15 | 3,000 | I | 14,000 | 177 | 7. | 12,310 |
| 16,000 16 15 15 15 15 15 15 15 | 4.000 | | 15,000 | | 4. | 14.1.44 |
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| 100 234 75 75 75 75 75 75 75 7 | | 29 | 2000 | - | | (52, 835 |
| 638 18,000 660 19 10 11 11 11 11 11 1 | - | 2 | 000,71 | 239 | 0.1 | 818 |
| 19,000 19,000 1,112 1,0 1,0 1,112 1,0 1,0 1,112 1,0 | + | 200 | 18,000 | 797 | | 0 |
| 181,176 19,000 1,112 1,00 1,112 1,00 1,112 1,00 1,112 1,00 1,112 1,00 1,112 1,00 1,112 1,00 1,112 1,00 1,112 1,00 1,112 1,00 | + | 800 | 19,000 | 1 | 8. | C |
| 1.00 1.112 1.00 1.112 1.00 1.112 1.00 1.112 1.00 1.112 1.00 1.112 1.00 1.112 1.00 1.112 1.00 1.112 1.00 1.112 1.00 1.112 1.00 1.0 | 1 | 2 | 20,000 | 0 | 6. | |
| (8,604 21,000 1,112 11 | | 144 | 000 12 | - | 10 | - 1 |
| 4,272 4,272 4,270 4,100 4,800 1,41 25,000 8,900 1,61 | - | 103 | 000. | 1,112 | 2 | 11,171 |
| 23, 055 4:7 24,000 4:8 25,000 16 26,000 16 29,000 16 29,000 16 29,000 17 25,000 18 30,000 18 30,000 | - | 272 | 77,000 | 424 | | _ |
| 4 25,000 141 25,000 141 25,000 14 25,000 14 25,000 14 25,000 14 30,000 15 20,000 16 29,000 17 25,000 18 30,000 18 30,000 | - | 1 1 | 23,000 | | | |
| 741 25,000 48 27,000 761 25,000 761 25,000 761 25,000 762 28,000 763 30,000 764 30,000 765 30,000 766 30,000 767 30, | - | 2/2 | 24.000 | | 1 | |
| 791 791 792 793 7900 794 7900 | | 4:7 | 25 000 | | - | - |
| 48 2000 16 28 28 000 16 30 000 17 30 000 18 30 000 19 30 000 10 | | 16 | 000,62 | n | | |
| 22 27,000 16 29,000 31,000 33,000 34,000 35,000 | - | 4.8 | 76,000 | - | | |
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| 27,090 | 25,000 | | | | | |
| 27,000 | 26.000 | | | | | |
| | 27,000 | I | | | | |
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TABLE B-55 SPECTRUM BS6. VPC1 (NO. 55)

DESCRIPTION: SPECTRUM NO. 6 W;TH DIFFERENT VALLEY/PEAK COUPLING

| SHIGHT HOURS | 16 | 2,500 | FLIGHTS = 2.4 | *LIGHTS = 2.422 | ANDINGS | = 3.843 |
|--------------------------|----|---------|----------------|-----------------|-------------------------|---------|
| TOTAL CYCLES | | 133.037 | AVERAGE NO. OF | F CYCLES PER: | FLIGHT | 54.9 |
| DANCE TRINCATION (PSI) = | | 4.000 | | | FLIGHT HOUR | 53.2 |
| HIGHEST PEAK (PSI) | 11 | 23.923 | | SMALLEST | SMALLEST VALLEY (PSI) = | -24.298 |

FLIGHT HOURS = 2.500
TOTAL CYCLES = 39.298
RANGE TRUNCATION (PSI) = 4.500
HIGHEST PEAK (PSI) = 22.114

DESCRIPTION: SPECTRUM NO. 1 WITH 4,500 PSI RANGE TRUNCATION.

TABLE B-56 SPECTRUM BS1.LLT1 (NO. 56)

| DISTRIBUTION | u | 261 | 589 | 295 | 888 | 427 | 989 | 307 | 822 | 115 | 80 ks | 64 | 19 | 18 | 164 | 384 | 1,200 | 4,603 | 19,039 | 81,598 | 5,787 | 198 | 0 | 0 | 14,983 | | | | | | | | | | | | | | | | | |
|--------------------|-------------|-----|---------|---------|---------|----------|--------|--------|--------|--------|--------------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| VICTO V | R | | 0.0 | 7.1- | 0. | | 0 | 1:- | 0.1 | ? • | 1.0 | 3.5 | 7.5 | | 0. | | 7. | | 4. | S. | ٦٠٠ | | 0.0 | | 0:- | | | | | | | | | | | | | | | | | |
| 10110 | u | | | | | | 0 | 30,422 | 42,507 | 33,250 | 11.669 | 2.084 | 7.008 | 173 | 1.5/3 | 50 | /85 | 170 | 52 | 43 | 47 | 124 | 155 | 452 | 1,087 | 154 | 9//5 | 801 | 366 | 73 | 861 | 23 | 7 | 0 | | | | | | | | |
| Maide Distribution | Range (psi) | | | | 000,1 | 2,000 | 3,000 | 000,4 | 000.5 | 0,000 | 000, | 000.0 | 000,6 | 000,01 | 000 | 12,000 | 13,000 | 14,000 | 15,000 | 16,000 | 17,000 | 000,81 | 000,61 | 000,07 | 000,17 | 22,000 | 23,000 | 25,000 | 000,62 | 000,02 | 000,00 | 000,02 | 20,000 | 30,000 | 31,000 | 32,000 | 33,000 | 34,000 | 35,000 | | | |
| 10110 | c. | | | | | 0 | 206 | 1.230 | 1.904 | 3,245 | 7.569 | 773 | 24 | 2 | 0 | 0 | 0 | 0 | 384 | 358 | 46 | 79 | 2,086 | 24,383 | 6,127 | 31,436 | 10,068 | 8,874 | 26,148 | 5,981 | 1,543 | 181 | 197 | 63 | 91 | 7 | , | , | 0 | | | |
| LAN DISTALDULION | Peak (psi) | | -12,000 | -11,000 | -10,000 | -0000.6- | -8,000 | 000,7- | -6,000 | 000.6- | -4,000 | -3,000 | 000,2- | 000.1- | 0 | 1,000 | 2,000 | 3,000 | 4,000 | 2,000 | 000,9 | 7,000 | 8,000 | 000.6 | 000,01 | 000,00 | 2,000 | 2000 | 000,41 | 000,61 | 000,01 | 000,71 | 000,81 | 000,61 | 20,000 | 21,000 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 |

| Peak (ps1) | PEAK DISTRIBUTION | NOTTON | RANGE DISTRIBUTION | UTION | R DIS | DISTRIBUTION |
|--|-------------------|--------|--------------------|--------|-------|--------------|
| 1,000 1,00 | | c | | u | R | u |
| 1,000 | 1 | | 1 | | | |
| 1,000 2,000 3,000 2,000 3,000 | | | | | | 19 |
| 1,000 | -12,000 | | | | 0.5 | 1,085 |
| 1,000 1,00 | 000,11- | | | | 7.1- | 34 |
| 2,000 4,000 4,693 6,000 4,693 6,000 4,693 6,000 4,693 10,000 1,466 11,000 2,2 11,000 1,466 12,000 1,466 13,000 1,466 13,000 1,466 13,000 1,466 13,000 1,466 13,000 1,466 13,000 1,466 13,000 1,466 13,000 1,466 13,000 1,467 13,000 1,467 13,000 1,467 13,000 1,467 13,000 1,467 1,400 1 | -10,000 | | 1,000 | - | -1.0 | 52 |
| 3,000 | -9.000 | | 2,000 | | 6 | 92 |
| 1,000 1,4,318 -1,6 | -8,000 | | 3.000 | | 8 | 2 5 |
| 1000 1/2 | 2000 | | 4 000 | 0 | 7 | 211 |
| 1000 1/468 1/15 | 000 | | 000 | 14,338 | 4 | 257 |
| \$\frac{1}{5}\frac{1}{ | 000.0 | 0 | 000.6 | 4,693 | | 290 |
| 1,000 4,922 | -2,000 | 5 /5/ | 000.9 | 10.841 | 6:- | 29 |
| 1000 1/468 1/2 1 | -4,000 | 1 384 | 7,000 | 4 922 | 4 | 25 |
| 10000 33 | -3,000 | 2010 | 8,000 | 0 7/1 | 3 | 0 |
| 10,000 52 0 64 64 64 64 64 64 64 | -2.000 | 22 | 000.6 | 1, 760 | 2 | 11 |
| 1,000 55 1,000 | 1,000 | 8/ | 000 01 | 332 | 1 | 14 |
| 12,000 55 1,000 65 1, | 000 | c | 000 | 52 | | 7 |
| 13,000 79 17,500 19,000 10,00 | 0 | * | 000. | 55 | 0 - | 89 |
| 3,000 1,9 1,5 1, | 1,000 | | 12,000 | 6 | | 32 |
| 4,000 7 1,000 7 1,000 1,00 | 2,000 | | 13,000 | a | .2 | 511 |
| 5.000 1.2 1.5 1. | 3 000 | | 14.000 | 1,1 | .3 | 410 |
| 10 10 10 10 10 10 10 10 | 000 | > | 15,000 | 0 | P | 2/1 |
| 354 17,000 7 1,500 17,000 1 | 4,000 | 0 | 000 | 2/ | | 4,508 |
| 1,000 1,00 | 2,000 | 254 | 000.0 | 7 | 0. | 7,389 |
| 18,000 17,000 1 | 000,9 | | 000.71 | 0 | 0.1 | 11.771 |
| 2, 2, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, | 7.000 | 9 | 18,000 | | - | |
| 1.0 | 000 8 | 7/ | 19.000 | - | 8. | 4 |
| 25.000 2 2.274 1,685 25.000 2 2.7 2,000 2 3.000 0 0.7 2,13 2.000 0 0.7 2,13 3.000 0 0.7 3,000 0 0 0 0.7 3,000 0 0 0.7 3,000 0 0 0 0 0 0.7 3,000 0 0 0 0 0.7 3,000 0 0 0 0 0 0 0.7 3,000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 000 | 997 | 20 000 | 747 | 0 | 0 |
| 1,955 1,000 26.7 1,66 2,000 1,315 1,66 2,000 1,315 1,516 | 000,00 | 2,294 | 000 | 96 | | |
| 7, 000 6, 253 10, 356 10, 356 10, 356 10, 356 10, 300 10, 31 10, 300 10, 30 | 10,989 | 1,955 | 000.12 | 752 | 2: | 99 |
| 23,000 2,777 2,777 2,777 2,000 2,777 2,000 2,777 2,000 2 | 11,000 | 1.067 | 000.22 | 1.375 | | |
| (2) 35 | 12,000 | 1 253 | 23,000 | 482 | | |
| 25,000 2,177 1,575 1,575 27,000 2,000 2,000 1,23 2,000 1,4 31,000 1,1 31,000 1,1 31,000 1,1 31,000 1,2 32,000 1,3 1,000 1,3 1,000 1,3 1,000 1,3 1,000 | 13,000 | 10 361 | 24,000 | 200 | | - |
| 26,000 1,577 27,777 28,000 1,23 29,000 1,23 29,000 1,33 1,000 1,4 31,000 1,4 31,000 1,4 31,000 1,4 31,000 1,2 1,2 1,000 1,2 1,2 1,000 1,2 1,000 1,2 1,000 1, | 14.000 | 10.00 | 25,000 | 100 | | |
| 7, 515 7, 515 7, 000 7, 23 7, 000 8, 000 8, 000 1, 34, 000 | 15,000 | 3,111 | 26.000 | 77 | - | |
| 28,000 28,000 38,000 1,3000 | 000 | 1,515 | 27 0000 | 0 | | |
| 723 729 7400 10 | 10,000 | 2// | 2000 | 2 | | |
| 26 33,000 1 34,000 1 34,000 1 34,000 1 35,000 1 37,000 1 38,000 1 38,000 1 38,000 | 0001 | /23 | 000.62 | 0 | | |
| 3,000 6 33,000 1 33,000 1 33,000 2 5,000 3 5,000 | 18,000 | 28 | 29,000 | 2 | | |
| 33,000 | 19,000 | 7/ | 30,000 | C | | |
| 9 0 | 20,000 | | 31,000 | | | |
| | 21,000 | 9 | 32,000 | | | |
| -0 | 22,000 | | 33.000 | | | |
| 0 | 22,000 | - | 34 000 | | | |
| | 000,52 | 0 | 000 | | | |
| 25,000 27,000 27,000 | 24,000 | | 35,000 | | | |
| 24,000 | 25,000 — | | | | | |
| 27,000 | 26,000 | | | | | |
| | 27,000 | I | | | | |
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TABLE B-57 SPECTRUM BS3.LLT1 (NO. 57)

| DESCRIPTION: SPECTRUM NO. 3 WITH 4,500 PSI RANGE TRUNCATION | | | | | | |
|---|----|---------|-----------------------------------|-------------------------|-----|---------|
| FLIGHT HOURS | | 2,500 | FLIGHTS = 5.112 | LANDINGS | | 5,112 |
| TOTAL CYCLES | H | 465,207 | AVERAGE NO. OF CYCLES PER: FLIGHT | FLIGHT | | 91.0 |
| RANGE TRUNCATION (PSI) = | H | 4.500 | | FLIGHT HOUR = | 11 | 186.1 |
| HIGHEST PEAK (PSI) | 11 | 24.588 | SMALLEST | SMALLEST VALLEY (PSI) = | = (| -15,692 |

PEAK DISTRIBUTION

Peak (psi)

AVERAGE NO. OF CYCLES PER: FLIGHT = 52.0
FLIGHT HOUR = 64.6
SMALLEST VALLEY (PSI) = -27,983

2.500 161,624 4.500 28,841

FLIGHT HOURS

TOTAL CYCLES

RANGE TRUNCATION (PSI) =
HIGHEST PEAK (PSI) =

DESCRIPTION: SPECTRUM NO. 4 WITH 4,500 PSI RANGE TRUNCATION.

TABLE B-58 SPECTRUM BS4.LLT1 (NO. 58)

DISTRIBUTION

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762 2,140 4,019 4,088 2,878 1,304 1,793

271 395 305 305 251 251 251 251 251 251 251 251 44,493 44,463 49,463

0 0

| SUTION | c | | | | | | | | 0 | 710 BU | 10,11 | 34, 437 | 30 508 | 20011 | 14,985 | 10 500 | 1407 | 1.772 | 000 | 523 | 216 | | 268 | 00 | | 80/ | 1 | 09 | 88 | 20 | 07 | 76 | 259 | | 2,754 | 6.350 | 3 / 8/ | 2,000 | 2,017 | 714 | 120 | | 14) | 12 | 12 | 2 | , | 8 | 77 | 1 | 00 | | | | | | | | | | | |
|--------------------|-------------|---|---------|---------|---------|------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|-------|--------|--------|------|--------|--------|--------|--------|-------|---------|--------|---------|--------|--------|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----|--------|--------|------|--------|--------|------|--------|--------|--------|------|--------|
| RANGE DISTRIBUTION | Range (psi) | | | | 1 000 | 000 | 7,000 | 3,000 | 000 | 000** | 2.000 | 000 | 000.0 | 7,000 | 000 0 | 8,000 | 000 | 000 | 000,00 | 000 11 | 000 | 12.000 | 12 000 | 13,000 | 14.000 | 000 | 15,000 | 16,000 | 200 | 000./1 | 18,000 | 000 | 000,61 | 20.000 | 2000 | 000,13 | 22,000 | 23,000 | 24 000 | 000,13 | 75,000 | 26.000 | 27 000 | 000,12 | 78,000 | 29.000 | 000 00 | 30,000 | 31,000 | 32 000 | 000 | 33,000 | 34.000 | 000 | 35,000 | | | | | | | |
| BUTION | c | | | | | | | | | | | 0 | 15.272 | 900 | 24,237 | 2 340 | 71.00 | 200 | | 2 | 0 | | 0 | C | | 0 | 2 472 | 2/1/2 | 1.719 | | | 6/ | 1.492 | 200 | 11,852 | 23 882 | 12001 | 1 | 10,340 | 27.950 | 83/9 | 4000 | 5,244 | 2.734 | 793 | 2 | 2/6 | 211 | 100 | 3 | 74 | 32 | | 11 | • | | 90 | | | 1 | 1 | (|
| PEAK DISTRIBUTION | Peak (psi) | | -12,000 | -11.000 | -10.000 | | 000.6- | -8,000 | -7 000 | 000 | 000.9- | 5 000 | 000.5 | -4,000 | 3 000 | 23,000 | -2.000 | 000 | 000,1- | | 000 | 000. | 2 000 | 7,000 | 3.000 | 000 | 4,000 | 5.000 | 000 | 0,000 | 7,000 | 000 | 8,000 | 000.6 | 000 | 33,000 | 000,11 | 12,000 | 13 000 | 000 | 14,000 | 15,000 | 16,000 | 000,01 | 000. | 18,000 | 10,000 | 000,61 | 20,000 | 21,000 | 000 | 77,000 | 23.000 | 0000 | 24,000 | 25,000 | 2000 | 000,97 | 27,000 | 28.000 | 0000 | 54,300 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IBUTION | c | - | 17 | - 14 | 2 | 606/ | 929 | 1973 | 2117 | 393 | 107 | - | 0 | 20 | 2 | 2 | 1 | 980 | 11 | | 5// | 1000 | 366 | 2 48 4 | | 8.956 | 18 60/ | 1000 | 188.647 | 777 | | 192 | C | | 0 | 25.432 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R DISTRIBUTION | ح د | 2 | | -1.2 | -1.0 | 1 | | , | - 7 | | 9 | | _ | 4 | , | | - 2 | | | | 5// | | | 2 48 4 | | _ | , 00 ac | 1000 | | 0. | 7 | | | | | 25.432 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | - | - | 1 | | , | - 7 | | 9:- | | | | 2 | | - 2 | | | | 5/1/ | 0 | , | - | 3, | - | 2 | | | | | ." | | 0 | | | 1048 | 207 | | 1 | 1,889 | 103 | | 353 | 24 | | | | | | | | | | | | | | | | | |

24,607 83,594 159,146 123,188 (25,438 6,08 8/4 186 186

23.000 24.000 25.000 27.000

-12,000 -11,000 -9,000 -7,000 -7,000 -5,000 -3,000 -1,000

TABLE B-59 SPECTRUM BS6.LLT1 (NO. 59)

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| = 3.843 | = 54.0 | 1 = 52.3 | = -24.298 |
|-----------------|----------------------------|------------------------|----------------------|
| LANDINGS | FLIGHT | FLIGHT HOUR | MALLEST VALLEY (PSI) |
| FLIGHTS = 2,422 | AVERAGE NO. OF CYCLES PER: | | SMALLES |
| 2,500 | 130,687 | 4.500 | 23,923 |
| | 11 | H | |
| FLIGHT HOURS | TOTAL CYCLES | RANGE TRUNCATION (PSI) | HIGHEST PEAK (PSI) |

FLIGHTS = 2.528 LANDINGS = 2.528

AVERAGE NO. OF CYCLES PER: FLIGHT = 32.6

FLIGHT HOUR = 33.0

SMALLEST VALLEY (FSI) = -24.298

FLIGHT HOURS = 2,500

TOTAL CYCLES = 82,385

RANGE TRUNCATION (PSI) = 3,500

HIGHEST PEAK (PSI) = 22,114

DESCRIPTION: SPECTRUM NO. 1 WITH 3,500 PSI RANGE TRUNCATION.

TABLE B-60 SPECTRUM BS1.LLT2 (NO. 60)

| | | П | 1 | | | | | | | _ | _ | Т | Т | Т | | | | | | | | | | | _ | | | _ | Т | Т | _ | | _ | _ | _ | _ | | _ | | _ | _ | _ | | _ | _ |
|--------------------|-------------|---|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----|--------|-------|--------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|
| DISTRIBUTION | c | | 275 | 169 | 557 | 648 | 564 | 299 | 344 | 211 | 78 | 59 | 64 | 63 | 15 | 16 | 172 | 883 | 3,947 | 154'81 | 43,296 | 46,350 | 45 | 0 | 0 | 13,062 | | | | | | | | | | | | | | | | | | | |
| R DISTR | æ | | -1.5 | | | | 200 | 0.1 | | 0. | 5. | 4 | | 7 | - | 0 - | " | 7. | ? * | 4. 4 | . 4 | 0. | | 0.0 | | 0 | | | | | | | | | | | | | | | | | | | |
| UTION | c | | | | | | | 0 | 00/5/ | 716 67 | 28 573 | 8 950 | 2648 | 1,103 | 289 | 95 | 43 | 21 | 14 | 9 | 11 | 26 | 87 | 96 | 408 | 1,087 | 1,004 | 144 | 140 | 364 | 27 | /63 | 30 | 7 | , | 0 | | | | | | | | | |
| RANGE DISTRIBUTION | Range (psi) | | | | 1 000 | 2000 | 000.5 | 3,000 | 000,4 | 2,000 | 0000 | 7,000 | 8,000 | 000.6 | 000.01 | 000 | 000,21 | 3,000 | 000,41 | 000,51 | 000,01 | 000,01 | 000,00 | 20,000 | 2000 | 22,000 | 22,000 | 24,000 | 25,000 | 26,000 | 27,000 | 200,000 | 20,000 | 30,000 | 000,00 | 31,000 | 32,000 | 33,000 | 34,000 | 35,000 | | | | | |
| BUTION | c | | | | | | 0 | 145 | 0/6 | 1362 | 3 084 | 4768 | 735 | 54 | 2 | 0 | 0 | ٥ | 0 | 272 | 278 | 80 | 121 | 979 | 8,166 | 10,258 | 19.099 | 35,735 | 8,660 | 25,995 | 5,940 | 1,549 | 186 | 197 | 63 | 9/ | 4 | 9 | | | | I | | | |
| PEAK DISTRIBUTION | Peak (psi) | | -12 000 | 000,11- | 10,000 | 000.01 | 000.6- | -8,000 | 000.7- | -6,000 | -2,000 | -4,000 | -3,000 | -2,000 | 000.1- | 000 | 000. | 2,000 | 3,000 | 000,4 | 000.5 | 000.0 | 000 | 000.0 | 000.6 | 11,000 | 2000 | 13,000 | 14,000 | 15,000 | 16,000 | 12,000 | 000 | 000 | 000.61 | 000,02 | 71,000 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 | 1 | |

| 292 |
|--------|
| |
| 23,185 |
| 5,000 |
| |
| -6,000 |

TABLE B-61 SPECTRUM BS3.LLT2 (NO. 61)

DESCRIPTION: SPECTRUM NO. 3 WITH 3,500 PSI RANGE TRUNCATION

AVERAGE NO. OF CYCLES PER: FLIGHT = 228.7
FLIGHT HOUR = 467.6
SMALLEST VALLEY (PSI) = -15.692 FLIGHT HOURS = 2,500

TOTAL CYCLES = 1,169,011

RANGE TRUNCATION (PSI) = 3,500

HIGHEST PEAK (PSI) = 24,588

AVERAGE NO. OF CYCLES PER: FLIGHT = 15.872

AVERAGE NO. OF CYCLES PER: FLIGHT HOUR = 112.5

FLIGHT HOUR = 140.0

SMALLEST VALLEY (PSI) = -27.983 FLIGHT HOURS = 2.500
TOTAL CYCLES = 349.938
RANGE TRUNCATION (PSI) = 3.500
HIGHEST PEAK (PSI) = 28.841

DESCRIPTION: SPECTRUM NO. 4 WITH 3,500 PSI RANGE TRUNCATION.

TABLE B-62 SPECTRUM BS4.LLT2 (NO. 62)

| PEAK DISTRIBUTION | BUTION | RANGE DISTRIBUTION | UTION | R DIST | DISTRIBUTION |
|-------------------|-----------|--------------------|---------|--------|--------------|
| Peak (psi) | c | Range (psi) | u | R | u |
| | | | | | |
| 200 | | | | 2 - | 765 |
| 000, | | | | | 2,253 |
| 000,01 | | 000 | | 7. | 4,233 |
| 000.01- | | 000, | | 2.0 | 4,456 |
| 000.6- | | 2,000 | 0 | 7.0 | 2,507 |
| 2,000 | | 3,000 | 157.826 | 0.1 | 1,047 |
| 000.7- | | 000,4 | 94,471 | 1:- | 611,1 |
| 000.4 | 0 | 2,000 | 28.914 | 0. | 8/9 |
| 000.6- | 15.273 | 000,000 | 27.357 | c | 689 |
| 000.4- | 26 291 | 000,7 | 17 777 | 4 | 341 |
| -3,000 | 2 340 | 8,000 | 10 03.5 | | 439 |
| -2,000 | 63 | 000.6 | 1067 | 2 | 34.5 |
| -1,000 | 0 | 10,000 | 500 | | 121 |
| 0 | , (| 11,000 | 787 | 0 | 503 |
| 1,000 | | 12,000 | 200 | | 200 |
| 2,000 | , | 13.000 | 202 | .2 | 100 |
| 3.000 | 0 | 14,000 | 45 | 3 | 126 |
| 000 | 0 | 16,000 | 101 | . • | 3,188 |
| 000. | 3,476 | 000,51 | 2.2 | 4 | 21,805 |
| 000.0 | 2,607 | 000,00 | 88 | 6. | 73.810 |
| 0,000 | - | 000, | 4 | 9. | 78 734 |
| 7,000 | 261 | 18,000 | 76 | 1. | ACV 201 |
| 8,000 | 28 333 | 19,000 | 212 | 8. | 2000 |
| 000.6 | 52303 | 20,000 | 2000 | 6. | |
| 10.000 | 24,300 | 21.000 | 3,434 | 1.0 | 2 |
| 11,000 | 34,214 | 22,000 | 6,115 | | 44,013 |
| 12,000 | 15491 | 23 000 | 3,472 | | |
| 12,000 | 112,531 | 23,000 | 1,735 | | |
| 3,000 | 30,828 | 000,42 | 537 | | |
| 14,000 | 14.909 | 000,62 | 29 | | |
| 15,000 | 67.5 | 26,000 | 04 | | |
| 16,000 | 2841 | 27,000 | (2) | | |
| 17,000 | 793 | 28,000 | /3 | | |
| 18,000 | 3/5 | 29,000 | 7 | | |
| 19,000 | 211 | 30,000 | - 0 | | |
| 20,000 | 107 | 31,000 | 0 0 | | |
| 21,000 | 200 | 32,000 | -0 | | |
| 22,000 | 74 | 33,000 | 0 | | |
| 23.000 | *) (*) | 34,000 | 0 | | |
| 000 | 11 | 2000 | | | |
| 000,42 | 00 | 22,000 | | | |
| 75,000 | 00 | | | | |
| 26,000 | L | | | | |
| 27,000 | 2 | | | | |
| 28,000 | , - | | | | |
| 29,000 | | | | | |
| | 0 | | | | |

| 000 252/178 000 00 | | . 1 | DISTRIBUTION | _ | NOT LOGITURE |
|--|---------|-------------|--------------|------|--------------|
| 1,000 2,000 3,000 2,000 3,000 2,000 3,000 2,000 | c | Range (psi) | c | œ | c |
| 1,000 2, | + | 1 | | | |
| 1,000 2,000 3,000 2,000 2,000 3,000 2,000 | - | T | I | -1.5 | 17 |
| 1,000 2,000 3,000 4,000 2,000 5,000 6, | | | | -1.2 | 100 |
| 2,000 3,000 2,000 | 0 0 | T | | -1.0 | 100 |
| 3,000 | 00 | T | | 6 | 1111 |
| 4,000 | 0 | | 0 | 0 | 248 |
| 5,000 5,000 6,000 8,000 10 | 11 | 000 | 521,178 | | 1,844 |
| 5,000 6,000 70,348 8,000 10,000 1 | 3.110 | | 2/8.003 | | 325 |
| 6,000 | 4 900 | T | 300 515 | 9,- | 173 |
| 7,000 | 4,10 | _ | 200,000 | 5 | 2 |
| 8,000 8,000 8,000 8,000 11,000 12,000 12,000 13,000 13,000 14,000 15,000 16,000 17,000 18,000 19,000 10 | 300 | | 90,398 | | 0 |
| 9,000 9,000 10,000 11,000 12,000 13,000 14,000 15,000 16,000 17,000 18,000 | 14.65 | | 24 756 | 4. | 39 |
| 9,000 | 31101 | Т | 200 | 3 | |
| 10,000 | 4,70 | Т | 2,4/6 | 2 | 1 |
| 11,000 | 902 | | 4,165 | | 980 |
| 1,000 | 5 | | 1.047 | - " | 9/ |
| 12,000 | - | T | 31.0 | 0 | 11.1 |
| 13,000 | 0 | T | 997 | | 4// |
| 14,000 | • | 2000 | 83 | | 359 |
| 14,000 | | 13,000 | 12 | 7. | 1.798 |
| 15,000 | + | 14,000 | 100 | .3 | |
| 16,000 17,000 18,000 19,000 19,000 19,000 10,000 | 1 | 15,000 | 97 | A | 1, 266 |
| 17,000 7 6.5 18,000 0 7 6.5 18,000 0 3 6.5 21,000 31/0 6.5 22,000 6.7 23,000 6.7 24,000 3.5 25,000 7.5 26,000 7.5 27,000 3.5 28,000 7.5 31,000 0 7.5 31,000 0 3.5 33,000 0 3.5 31,000 0 3.5 31,000 0 3.5 32,000 0 3.5 33,000 0 3.5 34,000 0 3.5 35,000 0 3.5 36,000 0 3.5 37,000 0 3.5 38,000 0 | * | 35,000 | // | . 4 | 29,117 |
| 18,000 18,000 19,000 21,000 21,000 22,000 23,000 26,000 26,000 27,000 26,000 27,000 28,000 20,000 | 0 | 000,01 | 7 | C. | 161:591 |
| 18,000 | 417 | Т | | 9. | 411 605 |
| 20,000 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 | - | Т | | 1 | |
| 21,000 21,000 21,000 21,000 21,000 21,000 21,000 22,000 23,000 26,000 27,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 31,000 31,000 31,000 31,000 31,000 31,000 32,000 33,000 31,000 31,000 32,000 33,000 31,000 31,000 32,000 33,000 33,000 33,000 34,000 35,000 36,000 37,000 38,000 | 0 | 7 | 2 | | 252,510 |
| 21,000 21,000 22,000 23,000 24,000 28,000 28,000 28,000 28,000 38,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 32,000 33,000 33,000 33,000 33,000 34,000 35,000 36,000 37,000 38,000 | 29 | | ٣ | 0.0 | 0 |
| 21,000 23,000 23,000 24,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 31,000 31,000 31,000 31,000 31,000 31,000 32,000 33,000 31,000 31,000 32,000 33,000 31,000 31,000 32,000 33,000 33,000 34,000 35,000 37,000 38,000 | (3 | Γ | 3/0 | 6. | 0 |
| 23,000 | 144 87 | 1. | 1 234 | 1.0 | 25.700 |
| 25,000 26,000 27,000 27,000 28,000 38,000 38,000 38,000 38,000 38,000 38,000 38,000 38,000 | 0.11 | Т | 1,637 | | 4 1,100 |
| 25,000 26,000 26,000 31,000 33,000 33,000 34,000 37,000 37,000 37,000 37,000 37,000 37,000 | 147,42 | _ | 2/6 | | |
| 25,000 26,000 27,000 27,000 37,000 33,000 37,000 37,000 37,000 37,000 37,000 | 671,65 | | 479 | | |
| 25,000 26,000 27,000 27,000 39,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 | 15 43 | _ | 2.8 | | |
| 26,000 27,000 28,000 38,000 38,000 38,000 38,000 38,000 38,000 38,000 38,000 | 121 101 | _ | | | |
| 27,000 28,000 30,000 31,000 32,000 34,000 35,000 | 140,66 | _ | | | |
| 33,000 33,000 34,000 35,000 37,000 37,000 37,000 | 29,08 | | 73 | | |
| 28,000 29,000 31,000 33,000 33,000 35,000 | 6.12 | | 350 | | |
| 33,000 31,000 31,000 32,000 33,000 34,000 34,000 | 35 | _ | 20 | | |
| 33,000 | 100 | _ | | | |
| 33,000 | 110 | T | 7/ | | |
| 33,000 | 181 | | 1 | | |
| 33,000 | 3.6 | _ | 0 | | |
| | 1 | T | | | |
| | | T | | | |
| | 12 | | | | |
| | 2 | | | | |
| | - | Т | | | |
| 0 | 1 | - | | | |
| | 0 | | | | |
| | | | | | |
| | - | I | | | |
| | + | 1 | 1 | | |
| | | | | | |

TABLE B-63 SPECTRUM BS6.LLT2 (NO. 63)

DESCRIPTION: SPECTRUM NO. 6 WITH 3,500 PSI RANGE TRUNCATION.

| FLIGHT HOURS | 11 | 2,500 | FLIGHTS = | :LIGHTS = 2.422 | LANDINGS | 11 | 3,843 |
|------------------------|----|---------|------------|-------------------|-------------------------|----|---------|
| TOTAL CYCLES | 11 | 311,256 | AVERAGE NO | O. OF CYCLES PER: | FLIGHT | н | 128.5 |
| RANGE TRUNCATION (PSI) | ** | 3,500 | | | FLIGHT HOUR = | = | 124.5 |
| HIGHEST PEAK (PSI) | - | 23,923 | | SMALLEST | SMALLEST VALLEY (PSI) = | = | -24,298 |

| DISTRIBUTION | u | 293 | 169 | 615 | 878 | 461 | 101 | 109 | 337 | 161 | 16 | 20 | 0 9 | 44 | 63 | 79 | 611 | 243 | 8/5 | nh0 e | 15 / 20 | 00000 | 7/0/00 | 99,259 | 118,190 | 0 | 0 | 14.218 | | | | | | | | | | | | | | | | | | | | |
|--------------------|-------------|---------|-----|--------|---------|--------|--------|---------|--------|-------|-------|--------|--------|--------|--------|-----|--------|--------|--------|--------|---------|--------|--------|--------|---------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|--|
| R DISTR | R | 2 1 | | 7.1- | 0: - | 6 | 8 | - 7 | , , | 0. | | 4 | 3 | 2 | | | 0.5 | - 6 | 7. | .3 | 4. | .5 | 9 | 1 | | 000 | 7. | 0. | | | | | | | | | | | | | | | | | | | | |
| UTION | u | | | | | | 2 | 131,244 | 75,585 | 65.70 | 24008 | 7 5.94 | 1000 | 797'7 | 1,037 | 266 | 83 | 53 | 20 | 7/ | | 2 | | 39 | 88 | 115 | 256 | 1,036 | 940 | 234 | 10% | 336 | 202 | 153 | 20 | 1 | | - | 0 | | | | | | | | | |
| RANGE DISTRIBUTION | Range (psi) | | | 000 | 000, | 2,000 | 3.000 | 4.000 | 5000 | 000 | 000.5 | 000.7 | 8,000 | 000.6 | 10.000 | 000 | 13,000 | 000,21 | 13,000 | 14,000 | 15,000 | 16,000 | 17,000 | 18,000 | 000 | 000.61 | 000,02 | 000,12 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 | 28,000 | 29,000 | 30,000 | 31 000 | 2000 | 32,000 | 33,000 | 34,000 | 35,000 | 1 | | | | |
| SUTION | c | 0 | 47 | 0 | 6 | | 0 | 523 | 943 | 1,384 | 3.098 | 7 7/9 | 730 | | 24 | 2 | 0 | 0 | 0 | 0 | 385 | 7777 | 117 | /2/ | 581 | 7,973 | 20,915 | 35,000 | 32.142 | 152 967 | 9.847 | 27 936 | 1683 | 1.564 | 100 | 197 | (3) | 20 | 9 | 4 | 9 | | | | | | | |
| PEAK DISTRIBUTION | Peak (psi) | -12 000 | 000 | 000 01 | 000.01- | -9,000 | -8,000 | -7.000 | 9- | 000 | 000.5 | -4,000 | -3,000 | -2,000 | -1,000 | | 1 000 | 000 | 000,2 | 3,000 | 000.4 | 2,000 | 000.9 | 7,000 | 000 0 | 000.0 | 000 | 999,01 | 000. | 12,000 | 13,000 | 14,000 | 15,000 | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 21 000 | 000,13 | 000,22 | 23,000 | 24,000 | 25.000 | 26,000 | 27,000 | | |

| BLE B-64 | BS1.LLT3 (NO. 64) |
|----------|-------------------|
| TABI | SPECTRUM BS |

DESCRIPTION: SPECTRUM NO. 1 WITH 3,000 PSI RANGE TRUNCATION.

FLIGHTS = 2,528 LANDINGS = 2,528
AVERAGE NO. OF CYCLES PER: FLIGHT = 38.0
FLIGHT HOUR = 38.4
SMALLEST VALLEY (PSI) = -24,298

FLIGHT HOURS = 2,500
TOTAL CYCLES = 95,954
RANGE TRUNCATION (PSI) = 3,000
HIGHEST PEAK (PSI) = 22,114

| PEAK DISTRIBUTION | BUTION | RANGE DISTRIBUTION | UTION | R DIST | DISTRIBUTION |
|-------------------|--------|--------------------|--------|----------|--------------|
| Peak (psi) | c | Range (psi) | - | æ | c |
| | | | | | |
| -12 000 | | | | 1 | 47 |
| 000 | | | | 2 | 1,086 |
| 1000 | | 2000 | | 7.1- | 27 |
| 000,01- | | 000. | | 0.1- | 3 |
| -9,000 | (| 2,000 | | 6 | 000 |
| -8,000 | 3 | 3,000 | 3 | 8 | 202 |
| -7.000 | 27 | 4.000 | 29010 | - 7 - | 210 |
| -6.000 | 0 | 2 000 | 19,349 | | 239 |
| 2000 | , | 000 | 2,430 | | 263 |
| 000 | 5,753 | 000.5 | 8.58/ | | 47 |
| 000 | 8,383 | 000.7 | 4.255 | 4 | 25 |
| -3,000 | 11.2 | 8,000 | 300 | 3 | 3 |
| -2,000 | 7// | 000.6 | 1,400 | 2 | 0 |
| -1.000 | 0 | 10.000 | 305 | | 47 |
| | 0 | 000 | 14 | - 0 | 4 |
| 000 | * | 000 | 46 | 0. | 689 |
| 000,1 | - | 12,000 | 0 | - | 35 |
| 2,000 | F | 13,000 | 9 | .2 | 3 |
| 3,000 | 1 | 14.000 | 11 | 3 | 627 |
| 000 | > | 15,000 | 0 | | 715 |
| 000 | 0 | 000 | 12 | . | 2.689 |
| 000 | 999 | 000,01 | 7 | c. | 866 17 |
| 0000 | 0 | 17,000 | | 9. | 35 750 |
| 7,000 | 2600 | 18,000 | 000 | .7 | 22, 730 |
| 8.000 | 2,007 | 19.000 | 10 | 0 | |
| 000 | 7,866 | 20 000 | 211 | 0.0 | 288 |
| 000 | 8,676 | 000,02 | 771 | 2. | 0 |
| 999,01 | 3477 | 71,000 | 260 | 0.1 | 13 607 |
| 11,000 | 1 750 | 22,000 | 1 36 8 | | 100'01 |
| 12,000 | 30 00 | 23.000 | 2001 | | |
| 13.000 | 32,676 | 24.000 | 345 | | |
| 14,000 | 14.284 | 25,000 | 70 | | |
| 15,000 | 5,629 | 25,000 | 8 | | |
| 000 | 1,652 | 000.02 | 0 | | |
| 000,01 | 214 | 7,000 | 2 | | |
| 0001 | 123 | 28,000 | | | |
| 18,000 | 28 | 29,000 | | | |
| 19.000 | 2 | 30.000 | 7 | | |
| 20.000 | 17 | 31 000 | 0 | | |
| 21 000 | 9 | 32 000 | | | |
| 2000 | , | 32,000 | | | |
| 000,22 | - | 33,000 | | | |
| 23,000 | 0 | 34,000 | T | | |
| 24,000 | | 35.000 | | | |
| 25.000 | | | | | |
| 26,000 | | | | | |
| 27,000 | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

TABLE B-65 SPECTRUM BS3.LLT3 (NO. 65)

DESCRIPTION: SPECTRUM NO. 3 WITH 3,000 PSI RANGE TRUNCATION.

| ELIGHT HOLIBS | н | 2,500 | FLIGHTS = 5,112 | - SDNIDINGS | 5,112 |
|-------------------------|----|-------|-------------------------------------|------------------------|---------|
| TOTAL CYCLES | н | 608 | AVERAGE NO. OF CYCLES PER: FLIGHT = | FLIGHT = | |
| BANCE TRIINCATION (PSI) | 11 | | | FLIGHT HOUR = | 631.5 |
| HIGHEST PEAK (PSI) | н | | SMALLES | MALLEST VALLEY (PSI) = | -15,692 |
| HOLLES LEAN (191) | | | | | |

| JIGHT HOURS = 2.500 FLIGHTS = 5.112 CANDINGS = 5.112 TAL LOYCLES = 1.578,809 AVERAGE NO. OF CYCLES PRES. FLIGHT = 308.8 NAME TRUNCATION (PSI) = 3.000 SMALLEST VALLEY (PSI) = -15.692 GHEST PEAK (PSI) = 24.588 |
|---|
| 11-21 |
| |

| R DISTRIBUTION | c « | 692 | 2,342 | 4,3/7 | 4,500 |
|--------------------|-------------|-----|---------|---------|--------|
| TION | u | | | | |
| RANGE DISTRIBUTION | Range (psi) | | | | 000. |
| UTION | c | | | | |
| PEAK DISTRIBUTION | (psi) | 1 | -12,000 | 000,11- | 10,000 |

DESCRIPTION: SPECTRUM NO. 4 WITH 3,000 PSI RANGE TRUNCATION.

TABLE B-66 SPECTRUM BS4.LLT3 (NO. 66)

| PEAK DISTRIBUTION | NOTION | RANGE DISTRIBUTION | BUTION | R DIST | DISTRIBUTION |
|-------------------|--------|--------------------|---------|--------|--------------|
| Peak (psi) | c | Range (psi) | c. | œ | c |
| | | | | | 27 |
| -12,000 | | | I | -1.5 | 2 20 |
| -11,000 | | | I | -1.2 | 4.0 |
| 000 | | 1 000 | | | 4, 31 |
| 000,01- | | 000. | | 0.0 | 4, 50 |
| -9,000 | | 000.2 | 0 | 2.0 | 2,42 |
| -8,000 | | 3,000 | 203 606 | 20: | 920 |
| -7,000 | | 4,000 | 001110 | | 187 |
| 9- | - | 5.000 | 501,107 | 9 | 10 |
| 000 | 1 | 000 | 24,198 | 2 | *0 |
| 000.6- | 15.273 | 000 | 25,226 | | 65 |
| -4,000 | 26 76 | 000, | 12.440 | 1. | 34 |
| -3,000 | 2 2/ / | 8,000 | 0 260 | | 63 |
| -2.000 | 2000 | 0000.6 | 2001 | 2 | 1/4 |
| 1,000 | 93 | 10.000 | 1,045 | - | 0 |
| 000 | ۲, | 000 | 505 | 0 | 8 |
| 0 | 0 | 000,11 | 183 | 0 - | 55 |
| 1,000 | C | 12,000 | 263 | | 88 |
| 2,000 | | 13,000 | 36 | - 2. | 1.52 |
| 3.000 | 0 | 14,000 | 200 | .3 | 361 |
| 4.000 | 2 | 15,000 | 101 | 4. | 1 |
| 000 | 4,636 | 16,000 | 70 | 2 | 04/1/ |
| 000,6 | 3/67 | 000.01 | 88 | | 92,48 |
| 6,000 | ~ | 000,71 | 40 | 0.1 | 108.44 |
| 7,000 | 2000 | 18,000 | 911 | 1 | 128 2 |
| 8,000 | 4,770 | 19,000 | 187 | 8. | 15/ |
| 0000 6 | 57.7.3 | 20.000 | | 6. | - |
| 000 | 71,688 | 21 000 | 2,584 | | - |
| 000 :: | 38.892 | 000 | 208'9 | | 10,44 |
| 11,000 | 17.539 | 000,22 | 2,975 | | |
| 12,000 | 7100 | 23,000 | 1345 | | |
| 13.000 | 11.01 | 24,000 | 007 | | - |
| 14 000 | 33,6/5 | 25.000 | 100 | | - |
| 000 | 17,253 | 26 000 | 46 | - | |
| 000,61 | 7,155 | 000,02 | 40 | | |
| 16,000 | 1486 | 27,000 | 12 | | |
| 17,000 | 101 | 28,000 | '> | | _ |
| 18.000 | 2 | 29,000 | | | |
| 000 01 | 2/6 | 30 000 | | | |
| 000.61 | 211 | 000 | 00 | | |
| 20,000 | 100 | 31,000 | 7 | | _ |
| 21.000 | 100 | 32,000 | 0 | | |
| 22 000 | 25 | 33.000 | 0 | | _ |
| 000 | 33 | 34 000 | 0 | | |
| 23,000 | 11 | 000,45 | | | |
| 24,000 | a | 35,000 | | | |
| 25.000 | 0 | | | | _ |
| 26,000 | 0 | | | | _ |
| 200 | u | | | | |
| 2,,000 | 2 | | | | - |
| 28,003 | I | | | | |
| 29,000 | 1 | | | | |

| DISTRIBUTION | u | | 77 | - | 394 | 1,855 | 839 | 011 | 200 | 71.7 | 43 | 0 | 39 | 2 | 98 | 9 | | + 0 | 200 | LPT. | 7,243 | 28,455 | 164, 399 | 409, 556 | 932,612 | 435 | 0 | 27791 | 7 | | | | | | | | | | | | | | | | | | | |
|--------------------|-------------|---|---------|--------|--------|---------|---------|--------|--------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|-------|--------|--------|----------|----------|---------|--------|--------|--------|---------|--------|---------|--------|---------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|
| R DIST | æ | | 5.1- | | | 0.1 | 5 | 8 | 7 | 9 - | , , | | 4 | 2.0 | 7.5 | - | 0 | - | 2 | 10 | ? • | 4. | c. | 9.1 | - | 8. | 6. | 0.1 | | | | | | | | | | | | | | | | | | | | |
| UTION | u | | | | | | 0 | 2 | 454 14 | 2,7,891 | 298,149 | 210.01 | 24 503 | 2 277 | 15.14 | 100 | 201 | 297 | 83 | 12 | 26 | 11 | 7 | 0 | 15 | | 694 | 001 | 920 | 120 | 944 | - 11 | 144 | 14 | 727 | 35 | 21 | | 0 | | | | | | | | | - |
| RANGE DISTRIBUTION | Range (psi) | | | | | 000 | 2,000 | 3,000 | 4.000 | 2000 | 000 | 000,5 | 7,000 | 8,000 | 0000.6 | 10,000 | 11,000 | 12,000 | 12,000 | 2,000 | 14,000 | 15,000 | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 21,000 | 22,000 | 23.000 | 24.000 | 25,000 | 26 000 | 27 000 | 000,000 | 000,00 | 000,62 | 30,000 | 31,000 | 32,000 | 33,000 | 34,000 | 35.000 | | | | | |
| BUTION | C | | | | C | 977 | | 0 ! | | 4,273 | 4 906 | 300 | 14/51 | 2001 | 1017 | 907 | 0 | 0 | 4 | | | , | | 863 | | 160 | 0 4 | 0.00 | 0 46.71 | 7 | 615,211 | 5.66 | 127,145 | 29,366 | 6,230 | 353 | 718 | 187 | 000 | - | | 100 | 7 | - | 0 | | | |
| PEAK DISTRIBUTION | Peak (psi) | 1 | 500 61- | 12,000 | 000'11 | -10,000 | -000.6- | -8.000 | -7 000 | 000 | 000.9- | -5,000 | -4,000 | -3,000 | -2,000 | -1.000 | 0 | 000 | 000 | 7,000 | 3,000 | 4,000 | 2,000 | 0000,9 | 7,000 | 8,000 | 000.6 | 10.099 | 11.000 | 12,000 | 13 000 | 14 000 | 000 | 000 | 10,000 | 000. | 18,000 | 19,000 | 20,000 | 21,000 | 22,000 | 23.000 | 24.000 | 25 000 | 24,000 | 000,00 | 21,000 | |

TABLE B-67 SPECTRUM BS6.LLT3 (NO. 67)

DESCRIPTION: SPECTRUM NO. 6 WITH 3,000 PSI RANGE TRUNCATION

| FLIGHTS = 2.422 LANDINGS = 3.3 | AVERAGE NO. OF CYCLES PER: FLIGHT = 175.6 | FLIGHT HOUR = |
|--------------------------------|---|---------------|
| 2.500 | 425.270 | 3.000 |
| | | |
| | | = |

| Peak (je.) | PEAK DISTRIBUTION | SUT10: | RANGE DISTRIBUTION | UTIO: | R DISTR | DISTRIBUTION |
|--|-------------------|----------|--------------------|--------|---------|--------------|
| Control Cont | (ps.i) | u | Range (psi) | u | æ | u |
| Control Cont | | | | | | |
| 1, | 000 | 0 | | | 5 1- | 304 |
| 1 | 200 | 47 | | | | 693 |
| 1, | 000 | 0 | 000 | | | 624 |
| 1 | 000 | 288 | 000.1 | | 0.1- | 899 |
| 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1 | | 0 | 7,000 | - | · · · | 163 |
| 7,272 7,000 7,727 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 11,000 88 11,000 12,000 13,000 14,000 16,000 17,000 18,000 19,000 10,0 | 000 | 923 | 3,000 | 200 | 8 | 1 |
| 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | 000 | 122 | 4,000 | 22000 | 7- | 2000 |
| 1, | 000 | 1/2/2 | 5.000 | 04401 | 9 | 233 |
| 3,102 7,000 23,300 7,000 7,523 7,000 7,0 | 000 | 9241 | 000 | 63,484 | | 621 |
| 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | 300 | 3,102 | 0000 | 23,300 | | 77 |
| 1, 000 1 | 000 | 7.753 | 000, | 7.476 | 4 | 58 |
| 1000 | 300. | 750 | 8,000 | 2 253 | 5 | 67 |
| 10,000 15,40 10,000 10 | 000 | | 00006 | | 2 | 100 |
| 1000 | 000 | 70 | 10.000 | 1,023 | - | 0 1 |
| 1,000 1,00 | 0 | 2 | 11 000 | 492 | 0 | 10 |
| 13,000 15,000 1 | 000 | 0 | 000 | 88 | > - | 611 |
| 13,000 14,000 15,000 15,000 16,000 17,000 18,000 | 000. | 0 | 12,000 | 53 | | 239 |
| 14,000, 14, 000, 15, 000, 15, 000, 16, 000, 17, 17, 17, 17, 17, 17, 17, 17, 17, 17 | 000 | 0 | 13,000 | 20 | .2 | 868 |
| 15,000 17 18 18 18 18 18 18 18 | 000 | | 14,000 | | .3 | 0.00 |
| 1, | 000 | 0 | 15,000 | 7/ | 4 | 3,018 |
| 11, 000, 11 2, 500 18, 000 18, 000 | 200 | 2/5 | 000 | 0) | | 13,634 |
| 1,1000 47 2,55 18,000 18 2,55 18,000 18 2,55 18,000 18 2,500 18,000 18 2,500 18,000 18 | 000, | 53/ | 000,01 | 11 | | 65,728 |
| 18,000 62 2,604 19,000 13,000 | 000, | 575 | 17,000 | 77 | 9. | 117.968 |
| 19,000 13t 1 | .000 | 2 6000 | 18,000 | 00 | 1. | 20105 |
| 1,5,0,5,7 | 000 | 400'7 | 19 000 | 70 | 8 | 202,73 |
| 1,000 1,00 | 300 | 1 22,577 | 000 | 136 | 0.0 | 334 |
| | 900, | 29,402 | 20,000 | 809 | | 0 |
| 22,000 154,169 154,169 154,169 156,137 158,169 159,000 16,31 16,21 17,000 18,21 18,000 18,21 19,000 19,0 | 30. | 115,051 | 21,000 | 1,103 | 0 | 14,921 |
| 25,000 26,137 26,137 26,137 26,000 1,587 1,587 27,000 1,587 28,000 1,587 29,000 1,587 29,000 1,587 1,587 29,000 1,587 1,587 29,000 1,587 1,587 29,000 1,587 1,587 1,97 1,587 | 000, | 34 611 | 22,000 | 892 | | |
| 24,000 26,337 25,000 2,541 25,000 25,000 25,000 27,000 1,52 1,52 28,000 1,67 31,000 1,67 31,000 1,67 1,77 1,77 1,77 1,77 1,70 1,77 1,70 1,7 | 000 | 156 189 | 23,000 | 379 | | |
| 26, 337 26, 337 27, 000 2, 76, 27 1, 287 1, 287 | 000 | 10 700 | 24,000 | 70 | | |
| Color Colo | 000 | 1000 | 25,000 | 250 | | |
| 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7 | 000 | 160,031 | 26,000 | 100 | | - |
| // 1/87 28,000 // 1/97 30,000 // 1/97 31,000 // 1/97 31,000 // 31,000 // 32,000 // 34,000 // 35,000 | 000 | 6,76/ | 27,000 | 72 | | |
| 786 787 787 80,000 63 78,000 78, | 000 | 1,587 | 28 000 | 921 | | |
| 1,4 33,000 | 200 | 186 | 20000 | 42 | | |
| 000 (SE 3),000 (SE 3), | 000 | 161 | 000,62 | e | | |
| 74 33,000 4 33,000 6 34,000 35,000 | 000. | 63 | 30,000 | , | | |
| 33,000 33,000 1,34,000 35,000 35,000 | 000 | 1/1 | 31,000 | 0 | | |
| 0 - 6 - | 000 | - | 32,000 | | | |
| 9-0 | 000 | , | 33,000 | T | | |
| -0 | 000 | , | 34 000 | | | |
| 0 | 000, | - | 34,000 | | | |
| | 000 | 0 | 35,000 | | | |
| 000', | 000 | | | | | |
| 000'1 | 0000 | | | | | |
| | 000 | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

LANDINGS = 3,843

.LES PER: FLIGHT = 69.6

FLIGHT HOUR = 67.4

SMALLEST VALLEY (PSI) = -24.298 435 437 437 489 489 489 127 DISTRIBUTION FLIGHTS = 2,422 LANDINGS AVERAGE NO. OF CYCLES PER: FLIGHT DESCRIPTION: SPECTRUM NO. 6 WITH ONLY ONE TAXI CYCLE PER LANDING. TABLE B-68 SPECTRUM BS6.LLT4 (NO. 68) 74,358 64,357 20,751 5,855 2200 173 173 25.9 RALGE DISTRIBUTION Cange (psi 1,000 1, FLIGHT HOURS = 2.500

TOTAL CYCLES = 168.583

RANGE TRUNCATION (PSI) = 4.000
HIGHEST PEAK (PSI) = 23.923 PEAK DISTRIBUTIO: Peak (psi)

TABLE B-69 SPECTRUM BS6.LLT5 (NO. 69)

DESCRIPTION: SPECTRUM NO. 6 WITH AN AVERAGE OF 25.9 TAXI CYCLES PER LANDING.

| ION. SI ECTIVO | | 10. O | | | | |
|---------------------------------|----|---------|-----------------------------------|---------------------------------|---------|-----|
| FLIGHT HOURS | Н | 2,500 | FLIGHTS = 2,422 | LANDINGS | = 3,843 | 100 |
| TOTAL CYCLES | 11 | 267,999 | AVERAGE NO. OF CYCLES PER: FLIGHT | R: FLIGHT | = 110. | |
| RANGE TRIINCATION (PSI) = 4,000 | В | 4.000 | | FLIGHT HOUR = 107.2 | = 107. | |
| LICUEST DEAV (DEL) = 23 923 | 1 | 23.923 | SMAL | SMALLEST VALLEY (PSI) = -24,298 | = _24. | 86 |

= 2.500
TOTAL CYCLES = 464.790
RANGE TRUNCATION (PSI) = 5.000
HIGHEST PEAK (PSI) = 24.588

DESCRIPTION: SPECTRUM NO. 3 WITH 5,000 PSI RANGE TRUNCATION.

TABLE B-70 SPECTRUM BS3.LLT4 (NO. 70)

| 04,470 | |
|------------|--|
| 1 | |
| ST VALLEY | |
| SMALLES | |
| | |
| | |
| | |
| 23,923 | |
| 11 | |
| PEAK (PSI) | |
| HIGHEST | |
| | |

| DISTRIBUTION | C | 12 | 17 | 89/ | 1.909 | 672 | 200 | 0/4/ | 104 | 64 | 0 | 39 | | 2 | 90 | 1/6 | 115 | 362 | 2.485 | 8 972 | 200 942 | 20,00 | 100,101 | 194,425 | 5 | 0 | 0 | 0000 | 25,432 | | | | | | | | | | | | | | | | | | | |
|--------------------|-------------|---------|-----|-----|---------|--------|--------|--------|-------|--------|---------|--------|--------|--------|--------|--------|---------|--------|-------|-------|---------|--------|---------|---------|--------|--------|--------|--------|--------|--------|---------|--------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----|--------|
| R DIST | cs | 2 !- | | 7 | 0.1- | 6 | 8 | 7 | | | -:- | 4 | | 2 | | 0 | 0 - | | 7: | 5. | 4. | r. | 9 | 2 - | | 0 | 6: | 1.0 | | | | | | | | | | | | | | | | | | | | |
| SUTION | u | | | | | | | | 0 | 314633 | 105,363 | 29 018 | 603 7 | 7,000 | 794% | 1,143 | 295 | 89 | (7 | 26 | (2) | 1 | | 0 | L | | 17/ | | 1.2/3 | 1,044 | 248 | 21 | 1.892 | 105 | 353 | 6.7 | 1 | | | 0 | | | | | | | | |
| RATGE DISTRIBUTION | Fange (ps;) | | | 000 | 000,1 | 7,000 | 3,000 | 4.000 | 5 000 | 000 | 000,000 | 000,7 | 8,000 | 000.6 | 10,000 | 11,000 | 000 | 000,21 | 3,000 | 4,000 | 15,000 | 16,000 | 17,000 | 000 | 000.01 | 000,61 | 20,000 | 21,000 | 22,000 | 23 300 | 23,000 | 000,47 | 25,000 | 000, 02 | 27,000 | 28,000 | 29,000 | 30.000 | 31 000 | 0000 | 32,000 | 33,000 | 34,000 | 35.000 | | | | |
| BUTION | C. | | | 0 | , | 0 | | 2 | 3,085 | 4,836 | 543 | 64941 | 107 6 | 1000 | 927 | 43 | 0 | < | | | I | > | 0 | 403 | 0 | 75 | 0 | 000000 | 26,376 | 83,566 | 158,907 | 13,855 | 123,127 | 46E'52 | 1.087 | 256 | 7/9 | 710 | 186 | 900 | 1 | 12 | , | 7 | | 0 | | |
| PEAK DISTRIBUTION | Peak (psi) | -12 000 | 000 | | 000,01- | -9,000 | -8,000 | -7.000 | 000 | 000,0 | 000.6- | -4,000 | -3,000 | -2,000 | -1,000 | 0 | י ממט נ | 2,000 | 7,000 | 3,000 | 4,000 | 2,000 | 6.000 | 200.2 | 000,7 | 8,000 | 000,6 | 10,000 | 11,000 | 12 000 | 000,21 | 13,000 | 14,000 | 12,000 | 16,000 | 17,000 | 18,000 | 19.000 | 20 000 | 000,02 | 71,000 | 22,000 | 23,000 | 24,000 | 25 000 | 200,02 | 000 | 27,000 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| DISTRIBUTION | c | | (88 | 598 | 297 | 386 | 766 | - | 0 | 154 | 541 | 4.8 | 7.5 | 000 | 13 | ar | 2 | 9 | 522 | 111 | 3,130 | 16,159 | 52,745 | 226.690 | 827 | | | | 11966 | | | | | | | | | | _ | | _ | | | | | | | | |
|--------------------|-------------|---|---------|-------|--------|---------|----------|--------|-------|---------|--------|--------|--------|--------|--------|--------|--------|--------|-----|-------|-------|--------|--------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--------|--------|--------|--------|--|
| R DISTRI | رد - | 1 | 5 | | 1 | 0. | 6 | 8 | - 1 | | 2.1 | 0:- | 4 | 3 | 2 | + | 0 | 1 | , | 1,0 | ? | 7. | 0.1 | 9. | 1. | 8. | 6. | - | 2 | | | | | | - | | | | | | | | | | | | | | |
| UTION | u | | | | | | | (| | 130,295 | 86.003 | 36.391 | TTE 8 | 1 629 | 802 | 200 | 197 | 28 | -4 | 90 | 3 | = | 11 | 5 | 50 | 300 | 300 | 700 | 1,298 | 499 | 136 | 486 | 55 | 707 | A.2 | 7 | | 7 | 0 | | | - | | - | | | | | |
| RANGE DISTRIBUTION | Pange (psi) | | | | | 000 | 2,000 | 3,000 | 4.000 | 000 | 2,000 | 0.000 | 7,000 | 8,000 | 000.6 | 10,000 | 11.000 | 12,000 | 000 | 000 | 000 | 000,61 | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 21 000 | 33 000 | 000,22 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 | 28,000 | 29,000 | 30.060 | 31 000 | 000 | 32,000 | 33,000 | 34,000 | 35,000 | 000 | | | | |
| SUTION | C | | 0 | 12 | 0 | L | 2890 | 9 | 12 | 17,639 | 22 248 | 27.300 | 0 822 | 200 | | 0 | 2 | 0 | 0 | 0 | 0 | 384 | 0000 | 100 | 225 | 000 | 4,636 | 11,250 | 34,408 | 31,829 | 36.126 | 9.003 | 26 363 | 030 | | 100 | 900 | 17. | 6.3 | 9 | 4 | 7 | - | - | 0 | | | | |
| PEAK DISTRIBUTION | Peak (psi) | | 000 61- | 2,000 | 000,11 | -10,000 | -0000.6- | -8.000 | 7 000 | 000 | 000,0- | -2,000 | -4,000 | -3,000 | -2,000 | -1,000 | 0 | 1 000 | 000 | 000,5 | 3,000 | 4,000 | 2,000 | 000,9 | 7,000 — | 8.000 | 0000.6 | 10 000 | 000,01 | 000.11 | 12,000 | 13,000 | 14,000 | 15,000 — | 16,000 | 17,000 | 18.000 | 19.000 | 20 000 | 000,02 | 71,000 | 22,000 | 23,000 | 24 000 - | 000,10 | 23,000 | 000'97 | 21,000 | |

TABLE B-71 SPECTRUM BS6.LLT6 (NO. 71)

| CRIPTION: SPECTRU | Σ | NO. 6 WITH 5 | DESCRIPTION: SPECTRUM NO. 6 WITH 5,000 PSI RANGE TRUNCATION. | | | |
|-----------------------|-----|--------------|--|-------------------------|------|---------|
| LIGHT HOURS | .11 | 2,500 | FLIGHTS = 2,422 | LANDINGS | н | 3,843 |
| OTAL CYCLES | 11 | 117,493 | AVERAGE NO. OF CYCLES PER: | FLIGHT | Н | 48.5 |
| ANGE TRUNCATION (PSI) | 11 | 5.000 | | FLIGHT HOUR = | H = | 47.0 |
| IIGHEST PEAK (PSI) | 11 | 23,923 | SMALLES | SMALLEST VALLEY (PSI) = | = (1 | -24,298 |

 DESCRIPTION:
 SPECTRUM NO. I WITH THE NUMBER OF 10 HIGHEST PEAKS

 INCREASED TO 100.
 FLIGHTS = 2.538
 LAN

 FLIGHT HOURS
 = 45.928
 AVERAGE NO. OF CYCLES PER: FLICAND FROM CY

TABLE B-72 SPECTRUM BS1.HILI (NO. 72)

| 1,000 | PEAK DISTRIBUTION | | RANGE DISTRIBUTION | SUTION | R DIST | DISTRIBUTION |
|--|-------------------|-----|---|--------|--------|--------------|
| 1000 | (15d) | - | | C | c: | u i |
| 100 | | Ţ | | | | |
| 1,000 1,00 | 000 | | | | | 7 26 |
| 1,000 | 1,000 | 7 | | | -12 | 645 |
| 100 | 000 | 0 | 1 000 | | | 284 |
| 100 | | 0 | 2000 | | 0:- | 846 |
| H/S | _ | 0 | 7,000 | | 6 | 284 |
| 1,000 1,00 | 177 | v | 3,000 | | 0 | 73.0 |
| 1,267 5,000 6,529 5 | | | 4,000 | | 7 | 188 |
| 1,246 | 1 | 2 | 5.000 | 0 | 9 | 100 |
| 100 | | _ | 000 9 | 69,539 | 2 | 28/ |
| 1,000 2,659 1,000 1,00 | | 2 | 000 | 29.863 | | 18 |
| 1000 1/8 1 | | 5 | 000. | 4596 | * . | 8 |
| 1,000 | T | in | 8,000 | 650 6 | | 7.0 |
| 10,000 1,001 1,0 | + | 1 | 000.6 | 100 | 2 | ., |
| 1,000 201 0 0 0 0 0 0 0 0 0 | 1 | | 10,000 | 1011 | 7 | 20 |
| 12,000 12,000 13,000 1 | - | 7 | 11 000 | 301 | 0 | 21 |
| 13,000 26 3 3 3 3 3 3 3 3 3 | | 0 | 000 | 001 | | 28 |
| 3,000 21 3,000 27 3 3,000 27 3 3,000 37 3 3,000 37 3 3,000 37 3 3,000 3, | - | 0 | 14,000 | 35 | - | 162 |
| 14,000 15 | 1 | T | 13,000 | | .2 | 1000 |
| 1,000 1,00 | - | | 14 000 | 21 | 100 | 438 |
| 1,000 1,00 | _ | 0 | 000 | /2 | | 1656 |
| 16,000 1/2 15,000 1/2 179 18,000 1/3 179 18,000 1/3 | - | | 000.61 | Ş | 4. | 14.372 |
| 17 000 13 17 000 13 17 000 13 17 000 13 18 18 18 18 18 18 18 | 1 | | 16,000 | | .5 | 977 17 |
| 18,000 9/4 18,000 325 19,000 34 19,000 34 19,000 34 19,000 34 19,000 34 19,000 34 19,000 34 19,000 34,000 34,000 35,000 | + | | 17.000 | | 9. | 019/11 |
| 100 24 100 34 100 34 100 34 100 34 100 34 100 34 100 34 100 34 100 34 100 34 100 34 100 34 100 34 100 34 100 34 100 34 35 30 36 36 36 36 36 36 36 | + | | 18 000 | /3 | 1 | 38,710 |
| 329 34 34 36 34 36 36 37 36 36 36 36 36 | | 21 | 000 | 16 | | 2 |
| 34,65 20,000 375 1.9 1.0 1.0 1.2 1.0 | - | ~ | 000,61 | 34 | 0.0 | 0 |
| 1.00 35/16 1.00 | | 6 | 000,02 | 375 | 7. | C |
| | 1 | 1 | 21,000 | 000 | 1.0 | |
| (8,744) (2,745) (2,7 | 1 | | 22,000 | 110 | | |
| 32,726 24,000 25,400 25,727 25,000 25,727 25,000 27,000 2 | | 6,0 | 200000000000000000000000000000000000000 | 6/1/ | | |
| 24,000 25,777 25,777 25,000 (64 7,700 (7,000 (7 | | 0 | 73,000 | 501 | | |
| 25,000 5,709 1,537 1,637 1,64 29,000 1,97 1000 1,0 | 1 | | 24,000 | 901 | | |
| | 1 | | 25.000 | 02 | | - |
| 7.700 1/537 1/637 28,000 1/67 29,000 1/67 31,000 1/67 31,000 1/67 32,000 1/67 32,000 1/67 32,000 1/67 33,000 1/67 35,000 | | - | 000 | 369 | | |
| 7,537 1,65 1,67 1,97 1,000 | - | 6 | 000.07 | 27 | | |
| /8 28,000 /97 29,000 /97 30,000 /4 31,000 /6 34,000 / 0 35,000 | + | 1 | 7,000 | /2/ | | |
| 797 29,000 63 31,000 76 32,000 7 33,000 6 34,000 7 35,000 | + | | 28,000 | 11.3 | | |
| 777 63 31,000 6 33,000 6 34,000 7 9 9 9 9 9 9 9 9 9 9 9 9 9 | 1 | | 29,000 | 22 | | |
| 63 31,000 4 32,000 6 34,000 0 35,000 | | | 2000 | 80 | | |
| 7, 31,000 4 33,000 6 34,000 1 35,000 | | - | 000 | , | | |
| 9-9-0 | | | 31,000 | 0 | | |
| 0-6- | 1 | I | 32,000 | | | |
| 9-0 | - | | 33 000 | | | |
| -0 | | | 000 | | | |
| 0 | | - | 34,000 | | | |
| 0 | - | T | 35.000 | | | |
| 0000,7 | | 1 | | | | |
| 000,7 | 000 | - | | | | |
| | 000's | | | | | |
| | 000' | | | | | |
| | | I | | | | |
| | 1 | 1 | 1 | | | |
| | | | | | | |

| 1,000 2,000 3,000 2,000 3,000 3,000 2,000 3,000 | 1) 10 10 10 10 10 10 10 10 10 10 10 10 10 | С | | |
|---|---|---------|-----|--------|
| 1,000 | 25,751 18,795 | | œ. | _ |
| 1,000 | 6,386 100 100 100 100 100 100 100 10 | | | |
| 1,000 2, | 2,5,5,5 10,0 10, | | | 11 |
| 1,000 2,000 2,000 4,000 2,000 4,4662 6,366 8,000 4,600 7,467 1,000 | 25/51 6/3/66 6/3/66 6/3/67 1/2/677 | | | 1,088 |
| 2,000 2, | 6,386 1,00 | | | 28 |
| 2,000 2,000 4,000 2,000 4,000 2,000 4,000 6,366 6,366 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,362 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,372 10,000 1,469 10,000 10, | 2,51.51 1,8 1,9 6 1,9 6 1,9 6 1,9 73 8 1,9 73 8 2,12 1 2,12 1 2,13 1 2,14 1 | | 0 | 2/5 |
| \$\begin{array}{c c c c c c c c c c c c c c c c c c c | 25,51 1,51,51 1,986 1,00 1 | | 2. | 8 |
| 4,000 22,083 6,366 6,366 6,366 6,000 6,367 7,000 10,000 10,000 10,000 11,000 12,000 13,000 14,000 13,000 14,000 14,000 15,000 16,000 17,000 18,000 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 0 | 0:- | 700 |
| \$\frac{5}{5}\frac{5}{100}\$ \frac{4}{4}\frac{6}{45}\frac{7}{2}\$ \frac{5}{100}\$ \frac{4}{4}\frac{6}{45}\frac{7}{2}\$ \frac{5}{100}\$ \frac{4}{4}\frac{6}{45}\frac{7}{2}\$ \frac{5}{100}\$ \frac{4}{10}\frac{6}{10}\$ \frac{6}{10}\$ \frac{6}{10} | 25/51 6/3/66 1/6 | 2000 | | 100 |
| \$\begin{align*} \begin{align*} \begi | 6,386 6,386 110 110 100 14,795 1,479 | 200,000 | 9 | 431 |
| 1,000 1,00 | 55.751 1.60 1.60 1.60 1.60 1.60 1.77 | 4,482 | 4 | 303 |
| 1000 1,679 1,000 1,362 1,000 1,362 1,000 1,362 1,000 1,362 1,000 1,362 1,000 1,362 1,000 1,362 1,000 1,362 1,000 1,362 1,000 1,362 1,000 1,362 1,000 1,362 1,000 1,372 | 6,386 100 100 100 100 100 100 100 10 | 10,236 | | 47 |
| 1000 1,362 1,100 1,000 | 10 10 10 10 10 10 10 10 | 619.4 | 4 | 52 |
| 1,000 1,00 | 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1 | 1362 | -:3 | 9 |
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| 1,000 79 1,000 1, | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 332 | | 24 |
| 1,000 79 1,000 | 499 499 499 4,795 6,458 1,4795 7 | 85 | - | 24 |
| 12,000 57 13,000 14,000 15,000 17,00 | 2/2 6/2 1/1/1 1/2/2 | - 62 | 0. | 105 |
| 13,000 53 13,000 7 14,000 7 14,000 7 14,000 7 15 | 2/2 1/2/ | 57 | - | 177 |
| 14,000 | 2/2 2/2 2/2 2/2 2/2 2/2 2/2 2/2 | | .2 | 900 |
| 15,000 | 499 499 60 60 60 60 60 60 60 60 60 60 | 2 | 1 | 630 |
| 1,000 | 0 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | 7 | ? < | 2/2 |
| 1,000 | 499 499 4,795 | /3 | * ' | 3,939 |
| 1,000 | 2/2 2/2 4/795 2/4745 2/478 2/478 1/1/03 3/492 1/52 1/53 1/53 1/53 1/53 1/53 1/53 1/53 1/53 | 7 | c. | 13.087 |
| 1000 19 100 19 100 19 100 19 100 19 100 19 100 19 100 19 100 19 100 19 100 100 10 1 | 2/2 1,9/2 4,795 2,677 2,478 1,1,1,1 1,1,1,2 1,2,2 1,2,3 1,2,3 1,2,3 1,2,3 1,2,3 1,3,4 1,4 1,4 1,4 1,4 1,4 1,4 1,4 1 | | 9. | 12 289 |
| 1,000 1,47 1,47 1,000 1,47 1,000 1,47 1,000 1,47 1,000 1,47 1,4 | 1, 9/12 1, 9/12 1, 1/13 1, | 9 | | 000 |
| 7.7 22.000 | 4,7476 4,7476 4,748 4,47 | 100 | 8 | 1/201 |
| 7, 795 21,000 297 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 2,745 2,677 7,771 7,771 7,771 7,772 3,492 2,492 2,492 2,14 2,1 | 44/ | - | 0 |
| 2, 2, 77 2, 100 2, 1, 17 2, 100 2, 1, 17 2, 100 2, 1, 10 | 2,677 1,1/1,1 1,478 1,1/1,1 1,527 | 707 | | 0 |
| 7, 11, 17, 17, 17, 17, 17, 17, 17, 17, 1 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 297 | 2 | 11.665 |
| 23,000 24,456 24,462 24,462 25,000 27,472 25,000 27,000 27,000 28,000 28,000 28,000 30,000 60 31,000 70 31,000 70 31,000 70 31,000 70 31,000 70 31,000 70 31,000 70 70 70 70 70 70 70 70 70 | (4,458) (1,103) (1, | 1 379 | | |
| 24,000 3,492 5,400 (2,74 (| 2 442 1,442 1,527 1,527 1,527 1,537 1,00 0,00 | 6377 | | - |
| 25,000 2,492 1,527 1,527 1,000 2,8 1,000 2,8 1,000 3,000 1,000 | 3,492 1,527 1,527 1,527 1,527 1,523 2,6 6,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1 | 1 | | - |
| 000, 12, 25, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | - | |
| 7, 527 7, 527 7, 529 7, 500 7, 500 7, 500 7, 500 7, 500 7, 600 7, 600 7, 600 7, 600 7, 600 7, 600 7, 600 7, 7, 800 7, | 274 727 727 28 28 32 60 60 70 | 17 | | |
| 27, 23, 000, 28, 000, | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 0 | | |
| 28 32,000 32 32,000 32 32,000 32 32,000 33,000 60 32,000 60 32,000 70 | 25 20 00 00 00 00 00 00 00 00 00 00 00 00 | 2 | | |
| 2.6 3.2,000 3.2,000 6.0 32,000 7.0 32,000 7.0 32,000 9.2,000 9 | 28 27 60 60 00 00 00 00 00 00 00 00 00 00 00 | 0 | | |
| 30,000 60 20,000 70 33,000 70 33,000 70 33,000 70 33,000 | 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0/ 0 | 2 | | |
| 33,000 100 100 100 100 100 100 100 | 0900 | | | |
| 0 9 2 0 | 0,000 | | | - |
| 500 | 550 | | | |
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| The same of the sa | | | | _ |

TABLE B-73 SPECTRUM BS1.HIL2 (NO. 73)

DESCRIPTION: SPECTRUM NO. 1 WITH THE NUMBER OF 10 HIGHEST PEAKS INCREASED TO 200

| FLIGHT HOURS | н | 2,500 | FLIGHTS = 2,528 | ANDINGS | = 2,5 | 528 |
|------------------------|----|--------|------------------------------|------------------------|-------|--------|
| TOTAL CYCLES | 11 | 46.059 | AVERAGE NO. OF CYCLES PER: F | -LIGHT | = 18 | .2 |
| RANGE TRUNCATION (PSI) | н | 4.000 | | LIGHT HOUR | = 18 | 4. |
| HIGHEST PEAK (PSI) | н | 22,114 | SMALLEST | MALLEST VALLEY (PSI) = | = -2 | 24.298 |

| 1,000 | 1,000 1,00 | (ps1) | FEAR DISTRIBUTION | RATIGE | DISTRIBUTION | R DIST | DISTRIBUTION |
|--|--|--|-------------------|---------|--------------|--------|--------------|
| 1,000 2,000 2,000 3,000 6,286 6,286 6,286 6,000 1, | 1,000 2,000 2,000 3,000 6,286 6,286 6,286 6,000 1, | 1,000 2,000 3,000 3,000 3,000 3,000 3,000 3,000 3,000 3,000 3,475 6,266 8,000 4,475 10,000 11,000 10,475 10,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 11,000 12,000 12,000 13,468 25,000 11,000 12,000 12,000 13,468 25,000 11,000 25,000 11,000 25,000 25,000 25,000 25,000 25,000 25,000 25,000 25,000 25,000 26,000 27,000 27,000 28,000 29,000 20 | | pande (| | Ci. | c |
| 1,000 22077 2,000 4,000 22077 3,000 4,000 22077 6,286 6,000 4,423 1,000 4,423 1,000 4,423 1,000 4,423 1,000 4,423 1,000 1,342 1,000 1,342 | 1,000 2,000 2,000 4,000 2,000 2,000 4,000 2, | 1,000 2,000 3,000 2,000 4,000 2,000 4,000 2,000 4,000 2,000 4,075 4,000 1,000 2,0227 1,000 4,000 1,032 1,000 1,000 | | | | | |
| 1,000 | 1,000 1,00 | 1,000 2,000 3,00 | - | | | 0 17 | 11 |
| 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 23,000 22,077 24,000 22,077 24,000 22,077 24,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 23,000 22,077 24,000 22,077 24,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 25,000 22,077 25,000 2 | 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 22,077 1,000 24,075 1,000 24,075 2,000 24,075 2,000 24,075 2,000 24,075 2,000 24,075 2,000 24,075 2,000 24,000 | 1,000 2,000 3,000 2,000 3,00 | 2 3 | | | | 1,088 |
| 1,000 2,000 3,00 | 1,000 1,00 | 1,000 2,000 4,000 2,000 1,000 2,00 | 000 | | | 7.1- | 28 |
| 2,000 4,000 4,000 4,000 4,475 6,286 6,000 6,000 6,000 6,287 6,000 6,000 6,287 6,000 6, | 2,000 4,000 4,000 4,000 4,000 4,475 6,286 8,000 6, | 2,000 3,000 4,000 4,000 4,000 4,000 4,000 4,000 4,000 4,000 4,475 6,136,4 8,000 4,400 11,000 6,7 11,000 1,10 | 000 | 000,1 | | 0.1- | i |
| 2,000 | 2,000 | 2, 2, 2, 1 2, 2, 2, 1 2, 2, 2, 1 2, 2, 2, 2 2, 2, 2, 2, 2 2, 2, 2, 2, 2 2, 2, 2, 2, 2, 2 2, 2, 2, 2, 2, 2 2, 2, 2, 2, 2, 2, 2 2, 2, 2, 2, 2, 2, 2, 2 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2 | 000 | 2 000 | | 0 - | 10 |
| 2,000 2,000 4,000 6, | 2,000 2,000 4,000 6, | 1,000 22,071 2,000 2,072 2,000 2,0 | 000 | 000 | | | 66 |
| 4,000 | 4,000 | 1,000 22,071 1,000 2,007 1,000 2,007 1,000 1,0 | 000 | 3,000 | - | 0:- | 700 |
| 1000 22/37 1000 23/35 1000 23/35 1000 23/35 1000 23/35 1000 23/35 1000 23/35 1000 23/35 1000 23/35 1000 23/35 | Company Comp | C C C C C C C C C C | 000 | 4.000 | | | - |
| 1000 | 1000 | 100 | 000 | 000 3 | 22,071 | 9 | 127 |
| 1,000 1,00 | 1,000 1,00 | 1,000 1,00 | 000 | | 4475 | 2 | 303 |
| 1,000 1,3¢Z 1,000 1,3¢ | 1,000 1,3¢Z 1,000 1,3¢ | 1,000 0,0,0,000 0,0,0,000 0,0,0,000 0,0,0,000 0,0,0,000 0,0,0,0, | + | 1 | 1000 | 5 | 177 |
| 1,000 1,362 -1.3 -1.5 | 1,000 1,362 -1.3 -1.5 | 1,000 247 1,000 247 1,000 247 1,000 247 1,000 247 1,000 247 1,000 247 1,000 247 1,000 247 1,000 247 1,000 247 1,000 247 1,000 247 1,000 247 1,000 247 1,000 247 2,000 2,00 | 1 | T | 10,441 | - 4 | |
| 100 1/362 -1.2 | 100 | 1/10 1/36.2 1/10 1/36.2 1/10 1/36.2 1/10 1/2 | | | 4,623 | 3 | 25 |
| 1,000 247 -1.2 | 1,000 247 1,000 | 1,000 347 3,000 347 | - | 1 | 1.362 | 2.0 | 0 |
| 10,000 67 10 10 10 10 10 10 10 1 | 10,000 67 10,000 10,00 | 10,000 67 10,000 67 12,000 12,000 67 12,000 67 12,000 67 67 67 67 67 67 67 | - | Τ | 200 | 7 | 13 |
| 1,000 106 10 | 1,000 106 10 | 1,000 106 1,000 106 13,000 106 14,000 17 15,000 17 16,000 17 17,12 17,000 17 17,12 | - | T | | - | 3 |
| 1,000 1,00 | 1,000 1,00 | 1,000 106 10 | | | 29 | 0 | 24 |
| 12,000 16,000 17,000 18,000 19,000 1 | 12,000 16,000 17,000 18,000 19,000 1 | 1,000 10 | | 000,11 | 100 | , | 124 |
| 3,000 2,000 1,00 | 13,000 20,000 13,000 13,000 14,000 17,000 1 | 13 000 1 | 000 | 12,000 | 101 | - | 63 |
| 14,000 9/, 13 14,000 1/5 15,000 1/5 15,000 1/5 15,000 1/5 15,000 1/5 15,000 1/5 15,000 1/5 1/5 15,000 1/5 | 14,000 9/4 14,000 1/2 | 1,000 1,00 | 000 | 13 000 | 100 | 2 | 200 |
| 15,000 1 | 15,000 17,000 1 | 1,000 1,00 | 000 | 000 | 16 | i | 238 |
| 15,000 | 15,000 7 15, | 15,000 | 200 | 14,000 | " | 7. | 245 |
| 1, | 1,000 1,00 | 1,000 7 7 7 7 7 7 7 7 7 | - | I | " | 4 | 200 |
| 17,000 | 1,000 | 17,000 7 17, | | | 5/ | | 2,482 |
| 17,000 / 4 / 4 / 5 / 5 / 6 / 6 / 6 / 6 / 6 / 6 / 6 / 6 | 1,000 1,00 | 17,000 79 70 70 70 70 70 70 | | Γ | , | c. | 13 102 |
| 2/2 18,000 19 | 2/2 18,000 19 3,000 19 3,488 25 3,000 10 2 2 2 2,000 17 | 212 18,000 1,912 2,012 2,010 2,017 2,000 2,017 2,000 2,017 2,000 2,017 2,000 2,017 2,000 2,017 2,000 2,010 2,0 | 1 | T | - | 9 | 1010 |
| 212 19,000 19 19 19 19 19 19 19 19 19 19 19 19 19 | 212 19,000 19 213 19,000 19 21,4712 20,000 19 2,677 22,000 19 2,477 23,000 29 2,400 7,77 2,000 25 2,000 1,17 2,100 25 2,000 27 2,000 25 2, | 1,4745 19,000 19 | | | , | - | 12,215 |
| 1,9/2 19,000 1,994 | 19,000 1994 19,000 1994 19,000 1994 19,000 1994 19,000 1994 19,000 1994 19,000 19,0 | 1,912 19,000 1,994 1,912 20,000 1,994 1,912 2,000 1,912 2,9100 1,912 1 | - | | 6/ | /- | 1,208 |
| 2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, | 2, 000 102 | 2, 000 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | - | T | 100 | 8. | 0 |
| 1.0 | 7, 17, 17, 17, 17, 17, 17, 17, 17, 17, 1 | 7, 17, 17, 17, 17, 17, 17, 17, 17, 17, 1 | + | Т | 111 | 0 | |
| 2,000 297 1.0 2,00 | 2,677 22,000 297 22,000 4/69 4/69 25,000 1/1 52c 25,000 1/1 52c 25,000 22 6,000 25 25 30,000 25 25 33,000 25 25 33,000 25 25 33,000 25 25 33,000 25 25 33,000 25 25 33,000 25 25 33,000 25 25 33,000 25 25 33,000 25 25 33,000 25 25 33,000 25 25 33,000 25 25 33,000 25 25 25 33,000 25 25 25 25,000 25 25 25 25,000 25 25 25 25,000 25 25 25 25,000 25 25 25 25,000 25 25 25 25,000 25 25 25 25 25 25 25 25 25 25 25 25 25 | 2,677 22,000 297 22,000 4,697 24,000 77 77 79 70 70 77 77 79 70 70 77 79 70 70 70 70 70 70 70 70 70 70 70 70 70 | | | 102 | | 0 |
| 1, 1, 1, 22, 000 1, 497 1, 102 1, 52c 1, 5 | 1,11 23,000 1,00 | 1,11/2 22,000 6,497 1,11/2 23,000 1,520 25,000 1,520 25,000 1,520 25,000 1,520 25,000 1,520 25,000 | - | i - | 297 | 0 | |
| 7,477 6,4497 11,400 3,488 25,000 1,52c 27,000 28,000 1,23 26,000 1,23 2,000 1,20 2,000 1,20 2,000 1,20 2,000 1,20 2,000 1,20 2,000 1,20 2,000 1,20 2,000 1,20 2,000 2,000 1,20 2,000 | 2,000 1, | 23,000 1,000 3,488 24,000 3,488 25,000 27,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 39,000 30,000 3 | | T | 1340 | | |
| (497 24,000 1,62 25,000 25,00 | (447 24,000 1,62 25,000 25,00 | (497 24,000 1,600 1,600 1,520 25,000 1,620 1,5 | 1 | 7 | 1,316 | | |
| 7/ / / / / / / / / / / / / / / / / / / | 7/ / / / / / / / / / / / / / / / / / / | 7, 160 1, 160 1, 224 2, 000 1, 524 2, 000 2, 000 | _ | | 696 | | |
| 25,000 1,52c 1,52c 1,52c 27,000 28,000 26 30,000 27 31,000 20 31,000 31,000 20 31,000 20 31,000 20 31,000 20 31,000 20 31,000 20 31,000 20 31,000 20 31,000 20 31,000 20 31,000 3 | 25,000 1,52c 1,52c 1,52c 2,000 2 | 25,000 1,52c 1,52c 2,000 2 | - | 1 | 77 | | |
| 1,52c,000 21,48c,000 21,400 22,000 26,000 26,000 26,000 26,000 27,000 28,000 20,000 | 1,52c,000 21,48c,000 21,400 22,000 26,000 26,000 26,000 26,000 27,000 28,000 20,000 | 1,52c,000 21,48c,27,000 21,400 22,5000 25,000 26,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 3,000 2,000 3,000 | - | I. | | | |
| 7, 52c, 25,000 2,1/4 28,000 26,000 26,000 27,000 20,000 20,000 20,000 20,000 20,000 20,000 20,000 20,000 20,000 30,000 20,000 | 7, 52c, 25,000 2,1/4 28,000 26,000 26,000 27,000 26,000 27,000 20,000 | 7, 52c 27,000 214 28,000 25 30,000 26 30,000 27 31,000 20 32,000 20 34,000 20 35,000 35,000 35,000 | | - | 11 | | |
| 27, 000 28, 000 26, 30, 000 52, 31,000 20, 32,000 20, 33,000 20, 34,000 20, 34,000 20, 35,000 | 27.4 28.000 26 30.000 26 30.000 27 31.000 20 33.000 20 34.000 20 35.000 35,000 | 27.000 28.000 28.000 28.000 29.000 120 13000 20 13000 20 14.000 20 35.000 35.000 | | | 0 | | |
| 28,000 26 30,000 27 30,000 20 31,000 20 33,000 20 34,000 20 35,000 | 28,000 26 30,000 27 30,000 20 31,000 20 33,000 20 34,000 35,000 35,000 | 7.2 28,000 2.6 30,000 5.2 31,000 2.0 32,000 2.0 33,000 2.0 34,000 35,000 35,000 | - | T | 1 | | |
| 723 26 30,000 720 31,000 20 32,000 20 34,000 35,000 35,000 35,000 | 723 26 30,000 720 31,000 20 32,000 20 34,000 35,000 35,000 | 723 246 30,000 720 31,000 20 32,000 20 34,000 35,000 35,000 | - | ī | 2 | | |
| 26 25,000 52 30,000 720 31,000 20 33,000 20 34,000 55,000 | 26 25,000 52 30,000 720 31,000 20 33,000 20 34,000 55,000 | 26 25,000 52 30,000 72 32,000 20 33,000 20 34,000 35,000 | | _ | 0 | | |
| 20 20 32,000 20 32,000 35,000 35,000 | 720 720 11,000 720 13,000 20 34,000 35,000 | 75 30,000 720 31,000 20 32,000 20 34,000 35,000 | - | Γ | 2 | | |
| 720 720 33,000 20 33,000 50 34,000 35,000 | 720 720 31,000 20 33,000 20 34,000 35,000 | 7.20 31,000 20 32,000 20 34,000 35,000 | - | T | | | |
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| 5,000 27,000 | 2,000 2,000 | 5, 1000 7, 2000 7, 2000 | 000 | 000.00 | | | |
| 27,000 | 27,000 | 27,000 | 200 | | | | |
| 27,000 | 22,000,12 | 27,000 | 000 | 1 | | | |
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TABLE B-74 SPECTRUM BS1.HIL3 (NO. 74)

DESCRIPTION: SPECTRUM NO. 1 WITH THE 10 HIGHEST PEAKS = 33,056 PSI

TABLE B-75 SPECTRUM BS1.HIL4 (NO. 75)

DESCRIPTION: SPECTRUM NO. 1 WITH THE 10 HIGHEST PEAKS = 27,750 PSI

| HOURS | 16 | 2,500 | FLIGHTS = 2.528 | ANDINGS | 11 | 2,528 |
|-----------------------|------|--------|------------------------------|------------------------|-----|---------|
| OTAL CYCLES | - 11 | 45.804 | AVERAGE NO. OF CYCLES PER: F | LIGHT | н | 18.1 |
| ANGE TRUNCATION (PSI) | 11 | 4.000 | | -LIGHT HOUR = | = | 18.3 |
| HIGHEST PEAK (PSI) | 11 | 27,750 | SMALLEST | MALLEST VALLEY (PSI) = | = (| -24.298 |

 DESCRIPTION:
 SPECTRUM NO.3 WITH THE NUMBER OF 10 HIGHEST PEAKS

 FLIGHT HOURS
 = 2.500
 FLIGHTS = 5.112
 LAN

 TOTAL CYCLES
 = 649.521
 AVERAGE NO. OF CYCLES PER: FLIK

 RANGE TRUNCATION (PSI) = 4.000
 = 24.588
 SMALLEST VA

TABLE B-76 SPECTRUM BS3, HIL1 (NO. 76)

| DISTRIBUTION | u | 16 | | 2901 | 82 | 20 | 96 | 101 | 000 | 107 | 303 | 47 | 52 | 0 | 717 | 10 | 2 | 68 | 30 | 235 | 507 | 9000 | 3,587 | (3,075 | 12,291 | 1,212 | 0 | 0 | 57711 | 200/11 | | | | - | | | | | | | | | | | | | | | | |
|--------------------|-------------|----|---------|---------|--------|------|--------|--------|--------|-----------|-------|--------|--------|--------|--------|--------|------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|
| R DIST | R | | -1.5 | -1.2 | 0 | 0.0 | 6 | 8- | 7 | 9- | 4 | | | 3 | 2 | 1 | | - | - " | 7. | .3 | 4. | 2 | . 4 | ٠, ١ | | 20.0 | 6. | 1.0 | | | | | - | | | | | | | | | | | | | | | | |
| TION | u | T | | | | | | | 000 | 040,22 | 1,487 | 142'01 | 4,614 | 1340 | 2:2 | 110 | 43 | 67 | 7 | 9/ | , | | /3 | 7 | - | 61 | 207 | 101 | 200 | 1372 | 010 | 77 | | | 0 | 7 | 0 | 2 | 0 | | | | | | | | | | | - |
| RAIGE DISTRIBUTION | Pange (psi) | | | | 1 000 | 000 | 7,000 | 3,000 | 4,000 | 5,000 | 000 | 000.5 | 000,7 | 8,000 | 000.6 | 10.000 | 000 | 2000 | 17,000 | 13,000 | 14,000 | 15.000 | 16 000 | 17,000 | 000,71 | 18,000 | 19,000 | 700,00 | 21,000 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 | 28 000 | 20,000 | 000,62 | 30,000 | 31,000 | 32,000 | 33,000 | 34 000 | 200.35 | 35,000 | | | | | |
| UTION | u | | - | | | | | - | 1 | - | 0 | 151'5 | 6,386 | 911 | 9 | 0 | 0 | 4 | | | 1 | > | 0 | 6617 | 0 | 212 | 1,912 | 4.795 | 27.7 | 11111 | 1 473 | 201 11 | 20171 | 2,176 | 1,500 | 412 | 123 | 28 | 12 | | | I | - | | | - | 0 | 10 | 0 | , |
| PEAK DISTRICUTION | Peak (psi) | | -12,000 | -11.000 | 16.000 | 0000 | -3,000 | -8,000 | -7.000 | -6 nnn A- | 6 000 | 000 | -4,000 | -3,000 | -2,000 | -1.000 | 0001 | 1 000 | 000 | 2,000 | 3,000 | 4.000 | 000 | 000 | 0000 | 000,7 | 8,000 | 000.6 | 10,000 | 11,000 | 12,000 | 13,000 | 14,000 | 15.000 | 16.000 | 17 000 | 000, | 18,000 | 19,000 | 50,000 | 21,000 | 22,000 | 22 000 | 20000 | 74,000 | 25,000 | 000'97 | 27,000 | 28,000 | |

| Peak (ps1) | | | WHITE DISTALDOLION | | | |
|--|----------|----------|--------------------|---------|--------|---------|
| 2 5 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 000 61- | U | | c | cc | С |
| 1000 1 | 000 01- | | | I | | 16 |
| 1,000 1,00 | 1,50 | T | | | 5.1- | 17 |
| 1,000 | -11,000 | | | | -1.2 | 150 |
| 2,000 3,004 4,000 4,000 4,000 4,000 4,000 4,000 5,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 1, | -10,000 | 0 | 1,000 | | -1.0 | 1013 |
| 100 | -0.000 | 3 | 2.000 | | 6:- | 1,760 |
| 100 | 000 | 0 | 3,000 | | 8 | 09/ |
| 3/64 5,000 26/27 -16 -175 | 2000 | 7 | 4 000 | 0 | - 7 - | 1,720 |
| 1,000 2,007 2,00 | 000 | 3,104 | 000 | 136212 | | 334 |
| 1,000 1,00 | -0,000 | 4.878 | 000,5 | 200727 | | 43 |
| 1, 4, 651 1, 1000 1, | -2,000 | 249 | 000.9 | 190/6 | · | ٥ |
| 1,000 1,00 | + | יחכבו | 7,000 | 25 32.5 | 4 | 84 |
| 1000 | + | 17,01 | 8,000 | 20,000 | 3 | 000 |
| 10,000 1,0 | 1 | 104'2 | 000.6 | 3 204 | 2 | 700 |
| 1,000 1,00 | 000 | 206 | 1000 01 | 4,183 | - | 42 |
| 1,000 270 1,000 | 000.1- | cs | 000 | 150% | | 34 |
| 13,000 19,000 1 | - | 0 | 000 | 270 | , . | 691 |
| 3,000 14,000 16,000 17,000 17,000 18,000 18,000 19 | 000, |) 4 | 12,000 | 187 | - | 259 |
| 14,000 | 2.000 | | 13,000 | 3 | .2 | 1 800 |
| 15,000 | 3.000 | T | 14.000 | - 6 | - | 7 3 , 7 |
| 1000 | 4 000 | 1 | 15,000 | 000 | 4 | 1,01 |
| 1,000 12 13 10 15 15 15 15 15 15 15 | 000. | → | 000 | 29 | | 29,126 |
| 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | 2,000 | 0 | 000,00 | 21 | | 166,297 |
| 18,000 1 | 0,000 | 480 | 200. | 0 | 9.1 | 411,666 |
| 19,000 255 19,000 255 10,000 255 10,000 255 10,000 255 10,000 255 10,000 255 10,000 255 255 25,000 255 25,000 255 25,000 255 25,000 255 25,000 255 25,000 255 25,000 255 25,000 255 25,000 255 25,000 255 25,000 255 25,000 255 25,000 255 25,000 255 25,000 255 25,000 255 25,000 255 2 | 7,000 | C | 18,000 | 10 | | 1,852 |
| 20,000 252 0,000 1,446,862 23,000 25,000 | 8,000 | 20 | 19,000 | 3 | ω. | 0 |
| 1.00 255 1.00 255 1.00 255 1.00 255 1.00 255 1.00 255 1.00 255 1.00 255 1.00 255 1.00 255 1.00 255 1.00 255 1.00 255 1.00 255 250 25 | 9.000 | 1 | 20,000 | 200 | 6. | 0 |
| 1,000 1,00 | 10 000 | 7 | 21,000 | 233 | 1.0 | k |
| 146,627 22,000 124,572 23,000 124,572 25,754 25,000 124,572 25,000 124,572 25,000 184, 1 | | 144,797 | 22 000 | 1,227 | ! | 1 |
| 25,000 1,24,572 25,000 1,24,572 25,000 25,725 25,000 25,725 26,000 333 29,000 814 814 30,000 186 11 12 13,000 15 16 17 18 19 19 10 10 10 10 10 10 10 10 10 10 | - | 146.857 | 000,27 | 366 | | |
| 24,000 27,154,572 25,100 2,106 2,106 2,106 2,106 2,106 2,106 2,106 2,106 2,106 3,100 1,000 1, | 1 | 8/6 65/ | 23,000 | 239 | | |
| 25,000 2,106 2,000 2,000 3,000 1 | 13,000 | 12959 | 24,000 | 18 | | |
| 25.735 26.700 3.53 28.00 28.00 8.14 8.14 30.00 186 31.000 186 31.000 186 187 31.000 180 180 180 180 180 180 180 | + | 200 | 25,000 | 1028 | | |
| 25.7.24 2.7.754 2.7.754 2.7.000 2.7.25 2.8.000 2.8.000 2.8.000 2.9.000 2.000 | 1 | 21,016 | 26.000 | 1,120 | | |
| 2, 100 814 184 196 196 196 196 196 196 196 196 | 16,000 | 75, 154 | 27.00ú | 0 | | |
| 253 29,000 18,4 30,000 34,000 20,000 37,000 10, | 11 | 6,108 | 20,000 | 322 | | |
| 38 30,000 38 32,000 1 33,000 1 33,000 20,000 1 33,000 1 33,000 1 33,000 1 33,000 1 00 1 00 | 000.71 | 353 | 000.00 | 35 | | |
| 186 31,000 31,000 10,000 12,000 12,000 10,00 | 18,000 | 7 % | 000.67 | 12 | | |
| 31,000 1 33,000 1 33,000 20 35,000 0 0 35,000 | 000,61 | 186 | 30,000 | 1 | | |
| 32,000 1 33,000 1 33,000 0 0 35,000 0 0 0 0 | 20,000 | 200 | 31,000 | 0 | | |
| 75 22 20 0 0 | 21.000 | | 32.000 | | | |
| 20 20 0 | 22 000 - | _ | 33 000 | | | |
| 0 0 0 | 22,000 | 75 | 000,00 | | | |
| 000 | 23,000 | 20 | 34,000 | | | |
| 20 | 24,000 | 2 | 35,000 | | | |
| +++ | 25.000 | 2 | | | | |
| 27,000 | 26,000 | 0 | | | | |
| | 27,000 | | | | | |
| | 000/17 | | | | | |
| | - | | | | | _ |

TABLE B-77 SPECTRUM BS3.HIL2 (NO. 77)

TABLE B-78 SPECTRUM BS3.HIL3 (NO. 78)

| DESCRIPTION : SPE | CTRUM | PECTRUM NO. 3 WIT | DESCRIPTION: SPECTRUM NO. 3 WITH THE NUMBER OF 10 HIGHEST PEAKS INCREASED TO 300 | KS | | DESCRIPTION: SPECTRUM NO. 3 WITH THE 10 HIGHEST PEAKS = 33,056 PSI. | M NO. 3 WITH T | HE 10 HIGHEST PEAKS | = 33,056 PSI |
|--------------------------|-----------|-------------------|--|---------------------------------|---------|---|----------------|----------------------------------|---------------|
| FLIGHT HOURS | 11 | 2,500 | FLIGHTS = 5,112 | LANDINGS | = 5,112 | FLIGHT HOURS | = 2.500 | FLIGHTS = 5.112 | LAND |
| TOTAL CYCLES | Н | 649,703 | AVERAGE NO. OF CYCLES PER: | | = 127.1 | TOTAL CYCLES | = 649,353 | AVERAGE NO. OF CYCLES PER: FLIGH | CLES PER: F |
| RANGE TRUNCATION (PSI) = | = (ISI) N | 4,000 | | JU. | = 259.9 | RANGE TRUNCATION (PSI) = | | | FLIGH |
| HIGHEST PEAK (PSI) | 11 | 24.588 | | SMALLEST VALLEY (PSI) = -15,692 | -15,692 | HIGHEST PEAK (PSI) | = 33,056 | | SMALLEST VALI |

| | PEAK DISTRIBUTION | 101100 | WANTED DESIGNATION | 101100 | 2 | DIST NI POLICIA |
|---|-------------------|----------|--------------------|---------|-------|-----------------|
| 1.00 | Peak (psi) | u | | u i | ď | u l |
| 1000 | | | | | | |
| 1000 1 | -12 000 | | | | | 21 |
| 1,00 | 000 | | | | | 17 |
| 1,000 | 000,00 | 0 | | | 7. | /50 |
| 2,000 4,676 4,000 3,000 1,4676 1,4676 1,000 | -10,000 | 50 | 000. | | 0 | 1943 |
| 100 | -0000.6- | (| 2,000 | | 6.* | 710 |
| 100 | -8.000 | 3 | 3,000 | | 8 | 200 |
| 1,000 2,1,954 1,000 2, | -7.000 | 7 | 4.000 | 0 | - 7 - | 1,720 |
| 1,676 1,67 | 000 | 3,104 | 0000 | 217,954 | | 334 |
| 1,000 2,00 | 000 | 4.878 | 000 | 300,718 | | 43 |
| 1,000 2,5,16 1,000 1,00 | 000,6- | 549 | 0,000 | 41 007 | ·.5 | C |
| 1,000 3,504 1,005 1,00 | -4,000 | | 7,000 | 01000 | 1 4 | 000 |
| 1000 | -3.000 | 169/6/ | 8-000 | 65,310 | - 3 | 000 |
| 1,000 1,05 | 2,000 | 2,401 | 0000 | 3,504 | | 7 |
| 1,000 1,005 1,000 1,00 | 000 | 206 | 000.00 | 4.183 | 7 | 501 |
| 1,000 275 1 | 000.1- | 6 | 000.01 | 2501 | - | 75 |
| 12,000 2,55 13,000 14,600 15,000 14,600 15,000 14,600 15,000 16, | 0 | 1 | 11,000 | 3007 | 0 | |
| 13.000 14.6 15.000 15.000 15.000 16. | 1 000 | 0 | 12 000 | 270 | - | 622 |
| 13,000 14,600 15,000 16,000 17,600 1 | 000 | 4 | 000,31 | 265 | - 0 | 359 |
| 14,000 /4/7 3.3 15,000 6 6 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 | 2,000 | | 13,000 | 177 | 7: | 1810 |
| 15,000 74 75 74 75 74 75 74 75 75 | 3.000 | 1 | 14.000 | 1, | 3 | 0,01 |
| 1000 | 000 | | 2000 | 64/ | . • | 7,360 |
| 10,000 1 | 4,000 | 7 | 000,61 | 25 | 4. | 29.169 |
| 17,000 6 7 7 7 7 7 7 7 7 7 | 2,000 | | 16,000 | 1/6 | 5. | 166 290 |
| 18,000 1 | 000.9 | 100 | 17,000 | | 9. | 1111 |
| 10 | 7.000 | 000 | 18,000 | 2 | 7 | 411,600 |
| 24 1000 225 1.0 144,653 23,000 235 1.0 144,653 23,000 235 23,000 235 23,000 235 23,000 235 23,000 235 23,000 235 23,000 235 23,000 235 23,000 235 23,000 235 23,000 235 23,000 235 23,000 23,000 23,000 23,000 23,000 23,000 23,000 23,000 25 23,000 | 000 | 0 | 000 | 9 | | 1881 |
| 100 | 000 | 54 | 000,61 | m | 0.0 | 0 |
| 1.000 | 3,000 | 2 | 20,000 | 225 | 6. | c |
| 22,000 1,227 1,59,493 23,000 239 1,24,514 25,000 355 25,000 355 25,000 355 25,000 355 25,000 355 25,000 1,228 26,000 355 27,000 355 28,000 7,228 28,000 7,238 28,000 1,228 28,000 355 29,000 1,228 31,000 7,238 18, 31,000 7,238 18, 31,000 7,238 18, 31,000 7,238 18, 31,000 7,238 18, 31,000 7,238 18, 31,000 7,238 20,000 355 20,000 355 | 10,000 | 100 801 | 21,000 | 1001 | 0.1 | 20 50 |
| 154 (23 3 23,000 154 (23 3 24,000 154 (23 4 2 | 11.000 | 11,000 | 22.000 | 1521 | | 40,010 |
| 25,000 25,734 25,734 25,000 25,000 25,000 25,000 27,000 27,000 28,000 814 814 31,000 1186 31,000 145 32,000 145 32,000 145 33,000 145 34,000 35,000 36,000 37,000 38,000 38,000 38,000 39,000 39,000 30 | 12 000 | 146,853 | 22 200 | 366 | | |
| 25,000 25,738 25,738 25,000 25,738 27,000 2,53 28,000 18,4 18,4 19,000 19,0 | 000,21 | 159 993 | 23,000 | 239 | | |
| 25,000 28,7754 26,000 28,000 28,000 28,000 38,000 38,000 38,000 38,000 38,000 39,000 31,000 31,000 32,000 34,000 35,000 36,000 37,000 38,000 38,000 39,000 30,00 | 13,000 | 13 959 | 24,000 | a/ | | |
| 25, 754 28, 754 28, 704 28, 704 28, 704 28, 704 28, 704 31, 000 18, 31, 000 18, 31, 000 19, 100 19, | 14,000 | 1211 674 | 25,000 | 000 | | |
| 25,754 26,708 2 29 2 8,000 2 29 2 9,000 8 14 3 1,000 1 18 3 1,000 1 19 1 1,000 1 19 1 1,000 1 19 2 0,000 1 | 15 000 | 115/21 | 26,000 — | 1,760 | | |
| 252 80,00 814 814 1100 1100 1100 1100 1100 1100 | 000 | 25,754 | 200.52 | 083 | | |
| 253 28,000 8 14 30,000 19 20,000 19 32,000 19 34,000 19 35,000 19 35,000 19 35,000 | 000,01 | 6.108 | 27,000 | 355 | | |
| 29,000 8,4 18,6 19,000 18,000 19, | 17,000 | 2 52 | 28,000 | 20 | | |
| 1 30,000 18 31,000 19 32,000 19 33,000 19 34,000 19 35,000 | 18.000 | 200 | 29.000 | | | |
| 186 31,000 145 33,000 145 34,000 26 20 20 35,000 | 10 000 | 100 | 30 000 | 2/ | | |
| 38 31,000 1 33,000 145 34,000 40 40 35,000 0 0 35,000 | 000,61 | 186 | 000,00 | , | | - |
| 32,000 145 34,000 60 145 34,000 0 0 0 0 0 0 0 0 0 0 0 0 | 50,000 | 3.5 | 31,000 | 2 | | |
| 0 50 H | 21.000 | | 32.000 | | | |
| 40 P | 22 000 | | 32 000 | | | |
| 0 0 0 | 000, 22 | 145 | 33,000 | | | |
| 0 0 0 | 23,000 | Tro- | 34,000 | | | |
| 90 | 24.000 | 2 6 | 35.000 | | | |
| - | 25 000 | 07 | | | | |
| 27,000 | 27,000 | 0 | | | | |
| 27,000 | 7000 | | | | | |
| | 27.000 | I | | | | |
| | | | | | | |
| | | | | | | |

| Peak (psi) n -1/2,000 -10,000 | 3,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 | c 0 | cz | u |
|--|--|---------|------|---------|
| | 777777777777777777777777777777777777777 | 0 | | |
| | | 0 | | |
| | | 0 | -1.5 | 17 |
| | | 0 | | 17 |
| | | 0 | 7 . | 8 |
| | | 0 | 0 | 1.963 |
| | | 0 | 6 | 740 |
| | | 0 | | 000 |
| | | - | 1 | 1,740 |
| | | 454,712 | . 4 | 334 |
| | | 300,745 | 2 4 | 43 |
| | | 91.052 | | 0 |
| | 11111 | 26 822 | 4 | 30 |
| | 7777 | 62/263 | -:3 | 2 |
| | TT | 3,504 | - 2 | 2 |
| | 000. | 4,187 | ! - | 986 |
| | 12,000 | 1.051 | - | 9/ |
| | 12 000 | 676 | 7 | 3// |
| | 000,21 | 200 | - | 000 |
| | 13.000 | (7 | 2 | 1557 |
| | 000 | 14 | ; ~ | 1,808 |
| | 000* | 22 | ;· | 7,270 |
| | 2,000 | 2 | 4. | 29.076 |
| | 16,000 | 1 | 2. | 166 171 |
| | 1 | | 9: | 8/7/88/ |
| | T | 0 | 7 | 711,600 |
| | 10 000 | n | . 0 | 1,850 |
| | 000.61 | m | 0.0 | 0 |
| | 00,00 | 225 | y | 0 |
| T | | 1227 | 0 | 20 70 8 |
| | _ | 200 | | 7 |
| 1 | _ | | | - |
| 13,000 | | 248 | | |
| 13,000 | | 8/ | | |
| 1/ | | 1,929 | | |
| - | Ī | 83 | | |
| 16,000 | 7- | 255 | | |
| t | 1 | 20 | | |
| - | 29,000 | 3 5 | | |
| - | 1 | 14 | | |
| _ | 000 | , | | |
| 3.8 | 2000,15 | 0 | | |
| 7 | 34,000 | | | |
| 22,000 | 33,000 | | | |
| - | 34,000 | | | |
| + | 35.600 | | | |
| 25 000 | | | | |
| 2000 | | | | |
| > | | | | |
| 0 | | | | |
| - | 1 | | | |
| 34,000 | 1 | | | - |

TABLE B-79 SPECTRUM BS3.HIL4 (NO. 79)

| DESCRIPTION: SPECTRUM | × | IO. 3 WITH TH | SCRIPTION: SPECTRUM NO. 3 WITH THE 10 HIGHEST PEAKS = 27,750 PSI. | PSI. | |
|---|---|-------------------------------------|---|--|------------------------------------|
| FLIGHT HOURS TOTAL CYCLES RANGE TRUNCATION (PSI) HIGHEST PEAK (PSI) | | 2.500 649.353 4.000 27.750 | FLIGHTS - 5,112 AVERAGE NO. OF CYCLES PER: | LANDINGS = :S PER: FLIGHT = FLIGHT HOUR = MALLEST VALLEY (PSI) = | 5,112 127.0 259.7 -15.692 |
| | | 00:11 | | 1011 | 10:01 |

| | T | T | 21 | 17 | I | 2 | n | 0 | | | 7 | 43 | 0 | 20 | T. | 0 | | | | 0 | T | - | 0 | | | | , | | T | | 60 | | Γ | T | T | T | _ | _ | _ | _ | _ | _ | _ | _ | | _ | _ | _ | _ | _ | | |
|--------------------|-------------|---|---------|-------|---------|---------|-------|-------|--------|--------|---------|---------|--------|-------|--------|--------|--------|------|------|--------|--------|--------|--------|----------|---------|---------|--------|--------|--------|--------|---------|---------|---------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|-------|--------|--------|---|
| DISTRIBUTION | | | - | , | 1 | 35/ | 1,963 | 760 | 1.020 | | 334 | ~ | | | 1 | | 86 | 9/ | 11.5 | 359 | 1 700 | 1,17 | 7,279 | 29,076 | 166,296 | 111 680 | 000 | 100 | 0 | 0 | 25,548 | | | _ | | | _ | _ | | | | | | | | | _ | _ | | | | _ |
| R DIS | cx: | | | | -1.2 | -10 | | 2. | 8 | 1 | 9 | | | 4 | 3 | 2 | - | | | - | .2 | - | | • | | 9. | 1 | 8. | 6 | | 2. | | | | | | | | | | | | | | | | | | | | | |
| UTION | c | - | | | | | | | 0 | | 456 412 | 300,745 | 97.052 | 25322 | 2 5000 | 2,007 | 1814 | 1301 | 269 | 70 | T | 14 | 22 | 0/ | 7 | 0 | 111 | | - | 226 | 1,227 | 566 | 239 | 18 | 1 928 | 000 | 200 | 355 | 35 | 14 | - | 0 | T | I | T | | | | | | | |
| RANGE DISTRIBUTION | Jange (psi) | | | | | 1.000 | 2 300 | 000.2 | 3,000 | 4.000 | 5,000 | 000 | 000.5 | 000, | 8,000 | 000.6 | 10,000 | 000 | 000 | 12,000 | 13,000 | 14.000 | 15,000 | 000 | 000.01 | 200.7 | 18,000 | 19,000 | 20,000 | 21 000 | 22,000 | 000.27 | 23.000 | 24,000 | 25,000 | 26,000 | 27.000 | 28,000 | 20 000 | 000,62 | 30,000 | 31,000 | 32,000 | 33,000 | 34.000 | 35 000 | 200.00 | | | 1 | 1 | |
| BUTIOI: | c | | | | - | 2 | 20 | 0 | 7 | 1 | 3,104 | 4,878 | 249 | 14651 | 2000 | 200 | 707 | 5 | 0 | 4 | | | | → | 0 | 480 | | 00 | 1 | 2 | 144,789 | 146,858 | 159,845 | 13.959 | 772 574 | 20.70 | 201107 | 6,100 | 353 | 6/4 | 166 | 280 | 1 | | | 0 | | | , | 9 | | 0 |
| PEAK DISTRIBUTION | Peak (psi) | | -12 AAA | 2,000 | -11,000 | -10.000 | 000 | 2000 | -8,000 | -7,000 | -6.000 | 5 000 | 000 | 1,000 | -3,000 | -2,000 | -1.000 | 200 | 000. | 000. | 2,000 | 3.000 | 4 000 | 000 | 000.0 | 000.0 | 7,000 | 8,000 | 9.000 | 10 000 | 000 | 000 | 000,21 | 13,000 | 14,000 | 15,000 | 16.000 | 17.000 | 1000 | 000 | 000,61 | 000.00 | 21,000 | 22,000 | 23.000 | 24 000 | 2000 | 2000 | 20000 | 27,000 | 28,000 | 1 |

TABLE B-81 SPECTRUM BS6.HIL2 (NO. 81)

| DESCRIPTION | SPECTRU | 2 | O. 6 WITH THI | DESCRIPTION: SPECTRUM NO. 6 WITH THE NUMBER OF 10 HIGHEST FEARS | HEST PEA | K3 | |
|--------------------------|-------------------|----|---------------|---|-----------|---------------------------------|---------|
| | INCREASED TO 200. | ED | TO 200. | | | | |
| FIIGHT HOURS | | 11 | 2.500 | FLIGHTS = 2.422 | | - LANDINGS | 3,843 |
| TOTAL CVCIES | | H | 181.858 | AVERAGE NO. OF CYCLES PER: FLIGHT | CLES PER: | FLIGHT . | 75.1 |
| RANGE TRINCATION (PSI) = | ATION (PSI) | n | 4.000 | | | FLIGHT HOUR = | 72.7 |
| HIGHEST PEAK (PSI) | (PSI) | Ħ | = 23,923 | | SMALLES | SMALLEST VALLEY (PSI) = -24,298 | -24,298 |

FLIGHTS = 2.422 LANDINGS = 3,843

AVERAGE NO. OF CYCLES PER: FLIGHT = 75.0

FLIGHT HOUR = 72.7

SMALLEST VALLEY (FSI) = -24,298

FLIGHT HOURS = 2,500

TOTAL CYCLES = 181,641

RANGE TRUNCATION (PSI) = 4,000

HIGHEST PEAK (PSI) = 33,056

DESCRIPTION: SPECTRUM NO. 6 WITH THE 10 HIGHEST PEAKS = 33,056 PSI.

TABLE B-82 SPECTRUM BS6.HIL3 (NO. 82)

| - 22 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | | C | - |
|---|--------|------|--------|
| 7025 / 272 / 273 / 273 / 274 / 275 / | (DS1) | Y | |
| 47 47 47 47 47 47 47 47 47 47 47 47 47 4 | | | |
| 20/ 20/ 20/ 20/ 20/ 20/ 20/ 20/ | | 0.0 | |
| 200 201 1, 373 1, 3 | | 7.1- | |
| 5) C C C C C C C C C | 88 | 0.1 | |
| 207 7026 7 | 200 | 7 | |
| 24 | 0 | 0. | |
| 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 74.9 | | 333 |
| 2006 2006 736 200 200 200 200 200 200 200 20 | - | 0.1 | _ |
| 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | - | | |
| 5) 16) 18) 18) 18) 18 19 20 20 20 20 20 20 20 20 20 20 | - | 4 | |
| 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | - | 7: | |
| 12 12 12 12 12 12 12 12 | + | 2 | - |
| 25. (2) (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4 | - | 7 | - |
| 388 388 388 388 388 388 388 388 | 00 | 0 | 151 |
| 17 17 17 17 17 17 17 17 | | - | |
| 3.5 8 3.5 8 4.197 1.19 1.19 1.19 1.19 1.19 1.19 1.19 | | | |
| 298. 1 29 | 22 | i | 795 |
| 358 358 47.79 77.29 24.09 25.09 26.09 | 34 | | 3,195 |
| 358 358 378 378 378 37,633 37,63 | - | 4. | 16,2/8 |
| 17 17 17 17 17 17 17 17 | - | 5. | 62 |
| 276 276 276 276 276 276 276 276 | - | 9. | 10000 |
| 210 4 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | 1 | 1 | 9 |
| 4,497 34,344 34,344 34,833 36,075 56,075 66,077 184 184 184 194 194 194 194 194 194 194 19 | - | 0 | |
| 21,220 17,216 18,1 18 | | 00 | |
| 20,5 (8.3) | - | | |
| 2/833 2/833 2/048 | " | 0 | 13,446 |
| 2006 181 181 181 181 181 181 181 18 | - | | |
| 2/0/6 2/0/2 2/0/0 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/0/2 2/0/0 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/0 2/0/2 2/0/0 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/2 2/0/0 2/0/2 2/0/0 2/0/2 2/0/0 2/0 2 | | | - |
| 25, 45 27, 45 | - | | - |
| 5) (2) (3) (4) (5) (6) (7) (6) (7) (7) (7) | - | | - |
| 7) 1 (2) 1 (3) 1 (3) | - | | - |
| 255 / | 00 | | |
| 187 | - | | |
| 191 | 25 000 | | - |
| 53 | 9 | | |
| 91 | , | | _ |
| | 0 | | _ |
| | | | _ |
| 201 | 000 | | _ |
| 231 | 00 | | |
| 07 | 0.00 | | _ |
| 0 | 200 | | |
| 25,000 | | | , |
| | | | _ |
| 000 | | | |

| PEAK DISTRIBUTION | SUTION | RALGE DISTRIBUTION | SUTION | R DIST | DISTRIBUTION |
|-------------------|--------|--------------------|---------|--------|--------------|
| Peak (psi) | u | Pange (psi) | U | 3 | C |
| | | | | | |
| | 0 | | | | 277 |
| 2,000 | 47 | | | | 869 |
| 10,000 | 0 | 000 | | 7.1- | 559 |
| 000.01- | 6 | 000. | | - | 698 |
| -9,000 | C | 7,000 | | 6 | 790 |
| -8,000 | 100 | 3,000 | 0 | | 457 |
| -7,000 | 1 | 4,000 | 11.00.1 | 1 | 232 |
| 000 9- | 1/4 | 5.000 | 14,751 | 9 - | 200 |
| 6 000 | 7373 | 9 | 66,143 | 14 | 16/ |
| 000 | 3084 | 000 | 24 928 | | 76 |
| -4,000 | 7.026 | 000,7 | 7.865 | 4: | 58 |
| -3,000 | 737 | 8,000 | 2200 | -:3 | 007 |
| -2.000 | 36 | 000.6 | 6,578 | 2 | - |
| 1 000 | 24 | 10 000 | 1,045 | - | 63 |
| 000*1- | 2 | 000 | 172 | | 79 |
| 000 | 0 | 000. | 93 | | 117 |
| 1,000 | | 12,000 | 77 | - | 543 |
| 2.000 | | 13,000 | - | .2 | 100 |
| 3 000 | 0 | 14 000 | 9/ | - | 14 |
| 0000 | 0 | 000 | 14 | ? • | 3,159 |
| 4,000 | 380 | 000.61 | 9/ | 4. | 14,122 |
| 2,000 | 200 | 16,000 | | 000 | 69 760 |
| 000 9 | 000 | 17.000 | | 9 | 24, 10 |
| 2 000 | 95 | 000 81 | 3/ | - | 87,731 |
| 000 | 246 | | 85 | | 839 |
| 8,000 | 4.197 | 000.61 | 117 | 0. | 0 |
| 2,000 | 17.220 | 20,000 | 044 | 7. | 0 |
| 000,01 | 20 300 | 21,000 | 6111 | 0.1 | 12 1111 |
| 11,000 | 21,574 | 22.000 | 2 | | 91118 |
| 12 000 | 31,653 | 23 .100 | 216 | | |
| 000 | 36,059 | 000 | 424 | | |
| 13,000 | 9,015 | 2000 | 611 | | |
| 14,000 | 26.378 | 000.52 | 347 | | |
| 15,000 | 6.028 | 26,000 | 22 | | |
| 16,000 | 27.0 | 27,000 | 1.7 | | |
| 17.000 | 1001 | 28.000 | 101 | | |
| 18 000 | 0/ | 000 52 | 67 | | |
| 1000 | 141 | 0000 | 9 | | |
| 000,61 | 63 | 30,000 | , | | |
| 20,000 | 1/2 | 31,000 | 0 | | _ |
| 21,000 | | 32.000 | | | |
| 22 000 | | 33,000 | | | |
| 000 | 0 | 200 | | | |
| 73,000 | * | 000.4 | | | |
| 24,000 | | 35,000 | | | |
| 25.000 | | | | | |
| 26,000 | | | | | |
| 27,000 | • | | | | |
| 23,000 | 0 | | | | _ |
| an'es | 01 | | | | _ |
| 34.000 | | | | | |
| - | | | | | |

TABLE B-83 SPECTRUM BS6.HIL4 (NO. 83)

DESCRIPTION: SPECTRUM NO. 6 WITH THE 10 HIGHEST PEAKS = 27,750 PSI.

| FLIGHT HOURS | 2,500 | FLIGHTS = 2.422 | LANDINGS | 3.843 |
|------------------------|---------|----------------------------|----------------------|---------|
| TOTAL CYCLES | 181,642 | AVERAGE NO. OF CYCLES PER: | FLIGHT | 75.0 |
| RANGE TRUNCATION (PSI) | 4.000 | | FLIGHT HOUR | 72.7 |
| HIGHEST PEAK (PSI) | 27.750 | SMALLES | MALLEST VALLEY (PSI) | -24,298 |

| -15,000 | (ps1) | (ps1) | PEAK DISTRIBUTION | NOI | RANGE DISTRIBUTION | NOTION | R DIST | DISTRIBUTION |
|--|---|---|-------------------|---------|--------------------|--------|--------|--------------|
| 1,000 1,00 | 1000 | 1,000 1,00 | | - | \neg | c | œ | c |
| 1,000 1,00 | 1,000 1,00 | 1,000 | + | | | | | |
| 1,000 | 1,000 | 1,000 | 12 mg | 0 | | | 5 1- | 112 |
| 1,000 | 1,000 | 1,000 | 2000 | 47 | | | 6 | 849 |
| 1,000 | 1,000 | 1,000 | 000 | 0 | | | 7.1- | 524 |
| 2,000 2, | 2,000 2,000 1,024 3,044 1,024 1,024 1,024 1,024 1,020 1, | 2,000 2,000 1,026 3,084 1,026 1,026 1,026 1,026 1,020 1,026 1,020 1, | 000,01 | 0 | 000 | | 0:1- | 970 |
| 1,000 1,00 | 100 | 100 | -0.00 | | 2.000 | | 6 | |
| 100 | 100 | 100 | 000 | 0 | 3000 | | 0 | 470 |
| 1,000 1,00 | 1,000 1,00 | 1,000 1,00 | 000.0 | 100 | 2000 | 0 | | 759 |
| 1,377 5,000 66,742 7,72 7,024 7,02 | 1,377 5,000 66,742 7,72 7,02 66,742 7,02 7 | 1,377 5,000 66,742 7,72 7,72 7,72 7,000 66,742 7,000 66,742 7,000 7,00 | -7.000 | | 4,000 | 640 76 | 1:- | 838 |
| 1,373 6,000 24,472 -1.5 -1. | 1,373 6,000 24,972 5 | 1,313 6,000 24,972 -1,5 -1, | 000 | * | 5 000 | 161/1 | - 6 | 200 |
| \$\frac{1}{2}\trac{1}{2 | 1,000 24,928 1,000 24,928 1,000 24,928 1,000 24,928 1,000 24,928 1,000 2,000 2,000 2,000 2,000 1,000 2,000 | 1,000 24,978 -1,000 24 | 000 | 1.373 | 000 | 66,/42 | | 141 |
| 1,000 1,00 | 1,000 1,00 | 1,000 1,00 | -2,000 | 2000 | 000,0 | 20 090 | C:- | 92 |
| 1,000 2,000 1,00 | 1,000 2,000 1,00 | 1,000 1,00 | -4.000 | 200 | 7.000 | | 4 | - |
| 13.000 1.0 | 13% 9,000 1,000 | 736 9,000 2,346 7.1.2 | 3 000 | 1,026 | 000 | 7,000 | 2 | 28 |
| 1,000 1,007 1,00 | 1,000 1,007 1,00 | 1,000 1,00 | 300 | 736 | 0000 | 2 346 | 2. | 6/7 |
| 10,000 1,0 | 10,000 1,0 | 10,000 1,0 | -2,000 | Ku | 000.6 | 3000 | 7.4 | 63 |
| 2 1,000 271 1,000 271 1,000 271 1,000 271 1,000 271 1,000 271 1,000 | 1,000 271 1,000 271 1,000 271 1,000 271 1,000 1,00 | 1,000 60 1,000 60 1,000 60 1,000 60 1,000 | 000 | 5 | 10,000 | 200 | - | • |
| 1,000 49 1,000 49 1,000 49 1,000 | 1,000 69 1,000 69 1,000 69 1,000 | 1,000 1,00 | 0000 | 2 | 000 | 112 | | 2 |
| 12,000 16 17 17 17 17 17 17 17 | 12,000 18 19 19 19 19 19 19 19 | 12,000 16 17 17 17 17 17 17 17 | - | < | 000 | 63 | | 9// |
| 13,000 16 17 18 19 19 19 19 19 19 19 | 13,000 16 15 15 15 15 15 15 15 | 13,000 16 18 18 18 18 18 18 18 | 000 | - | 12.000 | | | |
| 1,000 16 15 16 17 17 17 17 17 17 17 | 1,000 1,5 | 1,000 1,00 | 000 | 0 | 000 | \$ | | 243 |
| 14,000 15 15 15 15 15 15 15 | 14,000 15 15 15 15 15 15 15 | 14,000 15 15 15 15 15 15 15 | 2,000 | < | 13,000 | 4 | 7: | 708 |
| 358 15,000 15 15 15 15 15 15 15 | 15 10 15 15 15 15 15 15 | 15 10 15 15 15 15 15 15 | 3 000 | | 14.000 | 0 | 3 | |
| 1,000 15 15 15 15 15 15 15 | 1,000 1,5 1, | 384 15,000 15 15 15 15 15 15 15 | 0000 | 0 | 000 | 13 | | 3/58 |
| 16,000 1/2 1 | 16,000 17 18 19 19 19 19 19 19 19 | 16,000 17 18 19 19 19 19 19 19 19 | 4,000 | 284 | 000,61 | | 4. | 16 197 |
| 1,000 1,10 | 1,000 1,10 | 1, 000 1 | 2 000 | 200 | 16,000 | () | 5 | 1 |
| 1,000 32 1,000 32 1,000 32 1,000 32 1,000 1,100 32 1,000 1,100 32 1,000 1,100 1,100 1,000 1,100 1,000 | 1,000 32 1,000 32 1,000 32 1,000 32 1,000 1,100 32 1,000 1,100 32 1,000 1,100 | 1,000 32 1,000 32 1,000 32 1,000 32 1,000 1,100 32 1,000 1,100 32 1,000 1,100 | 000 | 358 | 000 | = | | 52,767 |
| 1,000 1,13 1,000 | 1,000 1,10 | 1,000 1,10 1,00 1,10 1,00 1,10 1,00 1,10 1,00 1,10 1,00 1,10 1,00 1,10 1,00 | 0000 | 95 | 1,000 | 32 | 0. | 89,730 |
| 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 | 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 1,19 1,000 | 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | 2.000 | | 18.000 | | 1 | 200 |
| 4/87 1/3 | 4/87 1/3 | 4/87 1/3 | | 240 | 000 01 | 18 | 0 | 100 |
| 1, 2 = 0 1, | 1, 220 1, 100 1, 13 1, 10 1, 10 1, | 1, 220 1, 100 1, 13 1, 13 1, 13 1, | | 4.197 | 000,61 | 6/1 | | 0 |
| 34,834 21,000 1,113 1.0 13, | 34,834 21,000 1,113 1.0 13, 13 | 21,000 1,113 1.0 1.3 1.0 1.3 1.0 1.3 1.0 1.3 1.0 1.3 1.3 1.0 1.3 1.3 1.0 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 | + | 7 920 | 20,000 | 426 | 5. | 0 |
| 34,394 34,639 34,639 24,639 24,639 24,639 24,639 24,000 24,337 24,000 24,337 24,000 24,337 24,000 24,337 25,000 27,000 2 | 34,334 34,634 34,634 34,634 24,634 24,634 24,634 24,634 24,000 2 | 34,334 34,634 34,634 34,634 4,645 6,000 6,000 | 1 | 1 | 21.000 | | 10 | |
| 2,000 2,007 2,007 2,007 2,007 2,000 2,000 1, | 27,000 24,005 24,005 24,006 24,006 24,006 25,000 26,005 27,000 27,000 28,000 29,000 20,000 | 2,000 2,603 2,603 2,603 2,603 2,603 2,603 2,603 2,000 2,603 2,000 2, | | 7101 | 000 | 1,113 | 2 | |
| 23,000 26,374 26,374 26,374 26,000 1,565 27,000 1,565 28,000 1,765 1,700 1, | 23,000 26,4379 26,4379 26,4379 26,000 26,4379 26,000 1,565 27,000 1,565 28,000 1,66 29,000 1,77 1,000 1,00 | 23,000 26,237 26,237 26,237 26,237 26,237 26,000 26,237 26,000 26,237 27,000 28,000 29,000 20,000 | - | 1 622 | 77,000 | 1/0 | | |
| 100 | 100 | 24,000 24,007 24,000 24,000 25,000 27,000 | 1 | | 23.000 | | | |
| 24,000 6,000 6,000 1,565 27,000 1,565 1,000 | 24,000 24,374 25,000 27,000 1,555 27,000 1,555 27,000 1,555 27,000 1,555 27,000 1,555 27,000 1,555 27,000 1,555 27,000 1,555 27,000 1,555 27,000 1,555 27,000 1,555 27,000 1,555 27,000 1,555 1,500 | 24,000 24,374 6,088 1,568 27,000 1,568 | | 16,059 | 000 | 427 | | |
| 25,000 6,028 1,565 1,565 1,000 1 | 25,000 6,028 1,565 1,565 27,000 1,565 28,000 1,000 | 25,000 6,028 7,565 7,000 7,565 1,565 1,565 1,000 1 | - | 5/00 | 24,000 | 117 | | |
| 6,000 6,000 1,565 27,000 1,565 28,000 1,000 | 6,000 1,555 1,555 1,000 1,555 1,000 1, | 6,000 1,555 1,555 1,000 1,555 1,000 1, | | | 25.000 | - | | |
| 6,000 1,565 1,565 1,000 1, | 6,000 7,000 | 20,000 1,555 1,600 1 | | 16.37 | 000 | 18 | | |
| 27,000 18,000 18,000 19,000 | 27,000 18,000 19,000 1,000 | 27,000 186 28,000 187 29,000 18,000 19 33,000 19 33,000 19 34,000 19 35,000 19 35,000 19 35,000 | 000.61 | A 600 A | 26,000 | 32 | | |
| 28,000 (43,000 (43,000 (43,000 (44, | 7, 365 7, 77 7, 77 6,3 10,000 7, 77 10,000 10,0 | 7, 365 7, 77 7, 77 7, 77 7, 70 7, 77 7, 70 7, 7, 70 7, 70 | 16.000 | | 27.000 | | | |
| 28,000 63 31,000 7,77 30,000 7,800 7,800 8,000 13,000 13,000 14,000 15,000 16,000 17,000 18,000 18,000 19,000 1 | 79 | (8) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1 | 000 | 1,565 | 000 | 161 | | |
| 23,000 (63) (13) (10) (13) (10) (13) (10) | 29,000 (63) 31,000 (74) 32,000 (74) 33,000 (75) 34,000 (76) 36,000 (76) 36,00 | 23,000 23,000 33,000 35,000 35,000 35,000 36,000 37,000 | 000. | 186 | 78,000 | * | | |
| E 3 4 - 0 4 - 0 0 0 | E 3 4 - 0 4 - 0 0 0 | E 34 - 0 0 0 | 18,000 | | 29.000 | | | |
| ® 4 - 0 ← → 0 0 0 | ₩ 4 - 0 < | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 000 | - | 000 | • | | |
| 9-0-000 | 9-0000 | 94-04-000 | 3,000 | 63 | 30,000 | - | | |
| 0000 | -04-090 | -0 -0 0 0 | 20.000 | 3 | 31.000 | | | |
| -04-000 | -0000 | -0000 | 000 | 9/ | 2000 | 0 | | |
| 00000 | 000000 | -0 | 000.12 | - | 32,000 | | | |
| 0 0 0 0 0 | 0 0 0 0 0 | 0 0 0 0 0 | 22 000 | - | 33,000 | | | |
| • | 0000 | <u>←</u> →0000 | 000 | 0 | 000 | | | |
| | 000 | 000 | 23,000 | 4 | 34,000 | | | |
| 000 | -000 | 000 | 24.000 | I | 35.000 | | | |
| | | | 000 | | | | | |
| H | - | | 25,000 | | | | | |
| + | + | +++ | 26,000 | - | | | | |
| + | + | | 22,000 | 0 | | | | |
| - | + | H | 2,,000 | 9/ | | | | |
| | | + | 28,000 | | | | | |
| | | | - | 0 | | | | |

080

LES PER: FLIGHT = 18.2
FLIGHT = 18.2
FLIGHT HOUR = 18.4
SMALLEST VALLEY (PSI) = -24.298 11,665 R DISTRIBUTION FLIGHTS = 2.528 LANDINGS AVERAGE NO. OF CYCLES PER: FLIGHT DESCRIPTION: SPECTRUM NO. I WITH THE 10 HIGHEST PEAKS = 33,056 PSI, AND THEIR NUMBER INCREASED TO 200. 2.00087.0048.01.001848.007.800.00 TABLE B-84 SPECTRUM BS1.HIL5 (NO. 84) 661 116 297 RALGE DISTRIBUTION Pange (psi) 2,000 2, FLIGHT HOURS = 2.500
TOTAL CYCLES = 46,056
RANGE TRUNCATION (PSI) = 4,000
HIGHEST PEAK (PSI) = 33,056 5,151 PEAK DISTRIBUTION Peak (psi) -12,000 -10,000 -10,000 -2,000 -2,000 -3,000 -1,000 2,000 2,000 3,000 11,00

TABLE B-85 SPECTRUM BS1.HIL6 (NO. 85)

AVERAGE NO. OF CYCLES PER: FLIGHT = 18.2

AVERAGE NO. OF CYCLES PER: FLIGHT HOUR = 18.4

SMALLEST VALLEY (PSI) = -24,298 DESCRIPTION: SPECTRUM NO. 1 WITH THE 10 HIGHEST PEAKS = 27.750 PSI, AND THEIR NUMBER INCREASED TO 200. = 2,500 = 46,056 = 4,000 = 27,750 RANGE TRUNCATION (PSI) HIGHEST PEAK (PSI) FLIGHT HOURS TOTAL CYCLES

| DISTRIBUTION | u | 11 | 1,085 | 28 | 12 | 66 | 190 | 200 | 162 | 303 | 24 | 52 | 0 | 27 | 747 | 130 | 53 | 3444 | 240 | 719 | 3,899 | 1,3060 | 12,259 | 1,210 | 0 | 0 | 599'11 | | | | | | | | | | | | | | | | | | | |
|--------------------|-------------|---------|-------|-----|----------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|--------|
| R DISTR | R | -1.5 | - 1 2 | | - | 6 | 8 | 7 | 9 | 2 | 2. | 4 | 2.0 | 7 | - | 0 | | .2 | .3 | 4 | . 4 | | 0. | | 0.0 | | 0.1 | | | | | | | | | | | | | | | | | | | |
| UTION | u | | | | | | | 2 | 010'22 | 4,473 | 10,227 | 4,610 | 1.360 | 3/7 | 173 | 1/2 | 17. | 10 | 00 | 9 | 77 | 7 | 29 | 21 | 310 | 111 | 244 | 1,373 | 69% | 77 | " | 0 | 2 | 0 | 2 | 0 | | | | | | | | | | |
| RANGE DISTRIBUTION | Pange (psi) | | | 000 | 000, | 7,000 | 3,000 | 4.000 | 6,000 | 200: | 000,0 | 000,7 | 8,000 | 0000.6 | 10,000 | 000,11 | 12,000 | 13,000 | 14.000 | 15,000 | 16,000 | 2000 | 000,71 | 000,01 | 000,60 | 000,02 | 000,12 | 000,22 | 23,000 | 000,47 | 000,62 | 7000,07 | 000,12 | 78,000 | 000,62 | 30,000 | 31,000 | 32,000 | 33,000 | 34,000 | 35,000 | 1 | | 1 | | |
| SUTION | C | | | | | | | | | 0 | 5,151 | 6.386 | 011 | 18 | 0 | - | I | | I | * | 0 | 667 | 0 | 2/2 | 1,912 | 4,795 | 2,677 | 1111 | 864'9 | 11,096 | 3,488 | 1,526 | 181 | 0 | 4 | | | - | T | | T | 1 | * | 0 | 200 | |
| PEAK DISTRIBUTION | Peak (psi) | -12 000 | 000 | 000 | -000,01- | -9,000 | -8,000 | -7.000 | 000 | 000 | 000,6- | -4,000 | -3,000 | -2,000 | -1,000 | 0 | 1,000 | 2,000 | 3.000 | 4 000 | 000 | 000 | 000,000 | 000, | 0000 | 000,6 | 000,01 | 000,11 | 12,000 | 13,000 | 14,000 | 000,61 | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 21,000 | 22,000 | 23,000 | 24,000 | 25.000 | 26,000 | 27.000 | 28000 | 000'97 |

25,548

225 1,227 1,947 1,945 1,945

0

-30

0 200

34,000.

TABLE B-86 SPECTRUM BS3.HIL5 (NO. 86)

DESCRIPTION: SPECTRUM NO. 3 WITH THE 10 HIGHEST PEAKS = 33,056 PSI, AND THEIR NUMBER INCREASED TO 200.

FLIGHTS = 5,112 LANDINGS AVERAGE NO. OF CYCLES PER: FLIGHT ELIGHT HOURS = 2,500

TOTAL CYCLES = 649,850

RANGE TRUNCATION (PSI) = 4,000

HIGHEST PEAK (PSI) = 33,056

127.1

FLIGHT HOUR = 259.9 SMALLEST VALLEY (PSI) = DISTRIBUTION 0 × 217,953 300,700 91,031 25,317 3,504 4,187 128 178 178 178 178 RANGE DISTRIBUTION (psi) 2,000 2, Pance 480 PEAK DISTRIBUTION Peak (psi) -12,000 -11,000 -10,000 -9,000 -7,000 -5,000 -4,000 -2,000 -1,000 1,000 2,000 1,

TABLE B-87 SPECTRUM BS3.HIL6 (NO. 87)

DESCRIPTION: SPECTRUM NO. 3 WITH THE 10 HIGHEST PEAKS = 27,750 PSI, AND THEIR NUMBER INCREASED TO 200.

| FLIGHT HOURS | H | 2,500 | FLIGHTS = 5,112 | LANDINGS | н | 5,112 |
|------------------------|---|---------|------------------------------|----------------------|---|---------|
| TOTAL CYCLES | | 649,361 | AVERAGE NO. OF CYCLES PER: F | = | | 127.0 |
| RANGE TRUNCATION (PSI) | | 4,000 | | FLIGHT HOUR : | | 259.7 |
| HIGHEST PEAK (PSI) | | 27.750 | SMALLES | MALLEST VALLEY (PSI) | н | -15,692 |

| | | | | | | | | | | | | | | _ | | | _ | _ | | _ | | | | | _ | | | _ | | _ | | | | | | | | | | | | | | | | | |
|--------------------|-------------|---------|-----|--------|---------|--------|--------|--------|---------|--------|--------|--------|-------|--------|--------|------|--------|--------|--------|--------|--------|---------|---------|--------|--------|--------|---------|---------|---------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|--------|--------|--------|---|
| DISTRIBUTION | c | 12 | 11 | 150 | 1,963 | 760 | 1,920 | 334 | 77 | | 0 | 28 | 2 | 85 | 14 | 100 | 34.2 | 1810 | 0,07 | 2921 | 54,073 | 166,294 | 411,680 | 1,850 | 0 | 0 | 25,548 | | | | | | | | | | | | | | | | | | | | |
| R DISTR | R | -1.5 | -12 | | 0 | 2.0 | 0. | 7 | 9:- | 5 | - 4 | | 2.6 | 3.5 | - " | | - | .2 | .3 | 4 | | | 9. | | 0.0 | 2. | 0 | | | | | | | | | | | | | | | | | | | | |
| UTION | c | | | | | | 0 | 217950 | 200 703 | Souper | 91,053 | 25,323 | 3,504 | 4.187 | 1.051 | 676 | 777 | " | | 36 | 6 | 7 | 0 | 6 | 6 | 242 | 1.227 | 866 | 239 | 8/ | 1,928 | 83 | 355 | 35 | /2 | 1 | 0 | | | | | | | | | | |
| RALGE DISTRIBUTION | Range (psi) | | | 1 000 | 000, | 2,000 | 3,000 | 4,000 | 5,000 | 000.9 | 2,000 | 0000 | 000 | 000,6 | 000.01 | 000. | 12,000 | 13,000 | 14,000 | 15,000 | 16,000 | 0000 | 000 | 000,81 | 19,000 | 20,000 | 21,000 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 | 28,000 | 29,000 | 30,000 | 31,000 | 32,000 | 33,000 | 34,000 | 35.000 | 2001 | | | | | |
| UTION | С | | | 0 | 50 | 0 | 7 | 2 100 | 4.0 | 4,010 | 249 | 14,651 | 2,401 | 206 | 8 | 0 | * | T | I | 1 | -> | 0 | 480 | 0 | 62 | 2 | 144 805 | 146.858 | 159.831 | 13,959 | 124.57W | 75 754 | 8017 | 153 | 8/4 | 184 | 20 | 0 | | 0 | 0 | 0 | 0 | 0 | 200 | | 0 |
| PEAK DISTRIBUTION | Peak (psi) | -12,000 | 000 | 000'01 | 000,01- | -9,000 | -8,000 | -7,000 | 000,9- | -5.000 | 4 000 | 000 | 2000 | 000,2- | 0001- | 0 | 1,000 | 2,000 | 3.000 | 000 | 000 | 000.5 | 000.0 | 2,000 | 8,000 | 000,6 | 000,01 | 1,000 | 12,000 | 13,000 | 14,000 | 15,000 | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 21,000 | 22,000 | 23,000 | 24.000 | 25,000 | 2000 | 200,00 | 21,000 | 28,000 | |

| | | 3,843 75.0 72.7 -24,298 |
|--|--|---|
| | | |
| | PSI, AND | LANDINGS = LES PER: FLIGHT = FLIGHT HOUR = SMALLEST VALLEY (PSI) = |
| TABLE B-88 SPECTRUM BS6.HIL5 (NO. 88) | DESCRIPTION: SPECTRUM NO. 6 WITH THE 10 HIGHEST PEAKS = 33,056 PSI, AND THEIR NUMBER INCREASED TO 200. | FLIGHTS = 2,422 AVERAGE NO. OF CYCLES PER: SMALLEST |
| SPECTE | O. 6 WITH ER INCRE | 2,500 181,824 4,000 33,056 |
| | M M | |
| | DESCRIPTION: SPECTRU THEIR NU | FLIGHT HOURS TOTAL CYCLES RANGE TRUNCATION (PSI) HIGHEST PEAK (PSI) |

| (psi) | | TOTAL CAST TOTAL | | | |
|---|--------|------------------|--------|-------|--------|
| -12,000 -11,000 -10,000 -9,000 -8,000 | u | Pange (psi) | п | ď | c |
| -12,000 -11,000 -9,000 -8,000 | 0 | | | | 777 |
| -10,000 -9,000 -8,000 | 47 | | | 5.7 | 698 |
| 9,000 | 0 | | | 7.1- | 559 |
| -9,000 | 0 | 1,000 | | -0.1- | 698 |
| 000 | 0 | 2,000 | | 5.0 | 064 |
| 000 | 201 | 3,000 | 0 | 0.1 | 459 |
| 000'/- | 4/6 | 4,000 | 74,960 | 1 | 333 |
| 000.9- | 1.373 | 2,000 | 66,131 | 0. | 197 |
| -5,000 | 3.084 | 000.0 | 24,915 | ç:- | 92 |
| -4,000 | 7.026 | 7,000 | 7.864 | 4 | 58 |
| -3,000 | 736 | 8,000 | 2.344 | | 64 |
| -2,000 | 75 | 000.6 | 1,045 | - 2 | 63 |
| 000 | 2 | 10,000 | 270 | : | 86 |
| 0 | 0 | 000,11 | 8.6 | 0. | 111 |
| 000,1 | 0 | 12,000 | 47 | - | 245 |
| 2,000 | 0 | 13,000 | 33 | .2 | 870 |
| 3,000 | 0 | 14,000 | 7/ | .3 | 3.274 |
| 4,000 | 380 | 15,000 | 9 | 4. | 16.121 |
| 2,000 | 258 | 16,000 | 12/ | 5. | 52756 |
| 0000,9 | 95 | 17,000 | 3,1 | 9. | 89.714 |
| 7,000 | 246 | 18,000 | 86 | 1 | 844 |
| + | 4.197 | 19,000 | 11.7 | | 0 |
| + | 17.820 | 20,000 | 467 | 9. | 0 |
| H | 34.344 | 7,000 | 1.113 | 9. | 13,446 |
| - | 3/ 833 | 22,000 | 1.033 | | |
| - | 34.065 | 23,000 | 440 | | |
| + | 9.011 | 24,000 | 151 | | |
| 1 | 26,380 | 25,000 | 377 | | |
| + | 6.017 | 26,000 | 24 | | |
| 16,000 | 1.565 | 77,000 | 19/ | | |
| 0000 | 186 | 28,000 | 74 | | |
| 0000 | 167 | 29,000 | , | | |
| 0000 | 63 | 30,000 | , | | |
| 20,000 | 16 | 31,000 | 0 | | |
| 21,000 | 1 | 32,000 | | | _ |
| 22,000 | 0 | 33,000 | | | |
| 0000 | 4 | 34,000 | | | |
| 24,000 | T | 35,000 | | | |
| 000 | 1 | | | | |
| 26,000 | Ţ | | | | |
| 27,000 | - | | | | |
| 33,000 | 000 | | | | |
| 34,000 | 200 | | | | _ |

TABLE B-89 SPECTRUM BS6.HIL6 (NO. 89)

3,843 75.0 72.7 -24,298 DESCRIPTION: SPECTRUM NO. 6 WITH THE 10 HIGHEST PEAKS = 27,750 PSI, AND THEIR NUMBER INCREASED TO 200. FLIGHT HOURS TOTAL CYCLES RANGE TRUNCA

| | | | SEE 10 200. | | | |
|--------------------------------|---|---------|----------------------------|------------------------|----|-----|
| FLIGHT HOURS | H | 2,500 | FLIGHTS = 2,422 LANDINGS = | LANDINGS | 11 | 6-1 |
| TOTAL CYCLES | - | 181,856 | AVERAGE NO. OF CYCLES PER: | FLIGHT | H | |
| RANGE TRUNCATION (PSI) = 4,000 | | 4.000 | | FLIGHT HOUR | 11 | |
| HIGHEST PEAK (PSI) | н | 27.750 | SMALLES | MALLEST VALLEY (PSI) = | | |

AVERAGE NO. OF CYCLES PER: FLIGHT = 75.0

FLIGHT HOUR = 72.7

SMALLEST VALLEY (FSI) = -24,298

FLIGHT HOURS = 2,500

TOTAL CYCLES = 181,644

RANGE TRUNCATION (PSI) = 4,000

HIGHEST PEAK (PSI) = 21,531

TABLE B-90 SPECTRUM BS6.CLPI (NO. 90)

DESCRIPTION: SPECTRUM NO. 6 WITH $P_{CL1P} \geqslant 21.531$ PSI.

| DISTRIBUTION | - | 277 | 869 | 623 | 678 | 100 | 044 | 654 | 333 | 161 | 92 | 88 | 0/1 | 1.0 | 63 | 79 | 611 | 243 | 793 | 2 , 6 3 | 3,133 | 16,127 | 52,775 | 89.73/ | 839 | 3 | 2 | 0 | /3,399 | | | | | | | | | | | | | | | | | | |
|--------------------|-------------|-----|-------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|---------|--------|--------|--------|--------|--------|--------|--------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| R DIST | æ | | 0.0 | 7.1- | -1.0 | 6 | 8 | 200 | 1. | 0 | 5: | 4 | 3 | 2 | | | 0 - | - • | 7: | .3 | 4 | . 4 | | 0.1 | 1. | 8. | 6. | 100 | 0 | | | | | | | | | | | | | | | | | | |
| NOTION | c | | | | | | | 0 | 74,950 | 66.142 | 24 930 | 7864 | 2000 | 6,376 | 1,050 | 272 | 92 | 55 | 17 | | 17 | 5 | 11 | 3/ | 28.5 | 117 | 900 | 435 | 1,113 | 11.6 | 427 | 11.7 | 367 | 22 | /67 | 24 | 7 | - | | 0 | | | | | | | |
| RANGE DISTRIBUTION | Range (psi) | | | | 000,1 | 2,000 | 3.000 | 4 000 | 000 | 000*6 | 000.0 | 000*/ | 8,000 | 000,6 | 10.000 | 11 000 | 12,000 | 000,21 | 3,000 | 14,000 | 15,000 | 16,000 | 2000 | 000*/ | 18,000 | 19,000 | 20.000 | 21 000 | 22,000 | 000,52 | 23,000 | 24,000 | 000,62 | 000,42 | 700,72 | 28,000 | 29,000 | 30,000 | 31,000 | 32 000 | 32,000 | 33,000 | 34,000 | 35,000 | | | |
| BUTION | C | 0 | 47 | C | 0 | - | 0 | 201 | 4/6 | 1,373 | 3.084 | 7.026 | 727 | 90 | 24 | 2 | 0 | 0 | 0 | | 0 | 384 | 358 | 36 | 246 | 4 197 | 7,7 | 11,550 | 34,344 | 31,033 | 36,061 | 9,0% | 26,378 | 6.028 | 1.565 | 186 | 197 | () | 2 | 16 | 11 | 0 | | | | | |
| PEAK DISTRIBUTION | Peak (psi) | | 2,000 | 000'11- | -10,000 | -000.6- | -8.000 | -7,000 | 000 | 0000 | 000.6- | -4,000 | -3,000 | -5,000 | -1.000 | | 000 | 000 | 7,000 | 3,000 | 4.000 | 2 000 | 000 | 00000 | 7,000 | 8,000 | 000.6 | 10 000 01 | 11,000 | 000 | 12,000 | 13,000 | 14,000 | 000,61 | 000,91 | 000.71 | 18,000 | 19,000 | 20,000 | 21 000 | 22,000 | 000,22 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| DISTRIBUTION | n | 777 | 698 | 655 | 869 | 490 | 459 | 333 | 161 | 92 | 58 | 64 | 63 | 96 | 157 | 243 | 805 | 3,282 | 16,180 | 52,756 | 89,706 | 844 | 0 | 0 | 13,446 | | | | | | | | | | | • | | | | | | | | | |
|--------------------|-------------|-----|---------|---------|---------|--------|-------|--------|--------|--------|-------|-------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|--|
| R DISTR | R | ! | 5.1- | 7.1- | -1.0 | 5.0 | 2. | 1 | 0.4 | | | | 7 | | 0 - | | 2.0 | ? * | 4. 4 | | 0. | | 20.0 | 7. | 0.1 | | | | | | | | | | | | | | | | | | | | |
| UTION | u | T | | | | | 0 | 74,960 | 66,123 | 24,915 | 7,864 | 2.344 | 1,045 | 270 | 93 | 79 | 33 | 24 | 69 | 12 | 66 | 6/1 | 156 | 740 | 1,115 | 116 | 427 | 117 | 367 | 22 | 167 | 24 | 9 | , | 0 | | | | | - | - | | | T | |
| RANGE DISTRIBUTION | Range (psi) | | | | 1,000 | 2,000 | 3,000 | 000,4 | 000.0 | 000,2 | 000, | 000.0 | 000,01 | 000,01 | 12,000 | 12,000 | 3,000 | 000,41 | 000,61 | 000,01 | 000,71 | 000,00 | 000,60 | 000,02 | 000,17 | 000,22 | 23,000 | 24,000 | 000,62 | 000,02 | 000,72 | 000,02 | 000,62 | 200,00 | 000,15 | 32,000 | 33,000 | 34,000 | 35,000 | | | | | 1 | |
| NOLLON | u | 0 | 47 | 0 | 6 | 0 | 201 | 416 | 1,373 | 3,084 | 7,026 | 736 | 24 | 2 | 0 | 0 | 0 | 0 | 384 | 358 | 95 | 246 | 4.197 | 17,220 | 34,344 | 31,833 | 36,097 | 110% | 26,380 | 110'9 | 1,565 | 186 | 197 | 63 | 16 | , | 0 | 0 | 0 | 0 | 0 | 200 | | 2 | |
| PEAK DISTRIBUTION | Peak (psi) | | -12,000 | 000'11- | -10,000 | -9,000 | 2,000 | 000. | 000,9- | 000 | 3,000 | 2,000 | 000 | 000 | 1 000 | 000 | 2,000 | 2,000 | 000 | 000.6 | 000,0 | 000 | 2000 | 000,00 | 000,01 | 000,00 | 12,000 | 2000 | 000,41 | 000.61 | 0000 | 000.0 | 000,000 | 000.65 | 000,02 | 000,12 | 72,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 | 28,000 | ! | |

TABLE B-91

| | | 3.843 75.0 72.7 -24,298 |
|----------------------------|--|---|
| | | u u u |
| | | LES PER: FLIGHT = FLIGHT HOUR = SMALLEST VALLEY (PSI) = |
| (NO. 91) | PSI. | 2 |
| SPECTRUM BS6.CLP2 (NO. 91) | LIP > 17,942 | FLIGHTS = 2,422 AVERAGE NO. OF CY |
| SPECTR | O. 6 WITH PC | 2,500 181,644 4,000 17,942 |
| | M | 1 1 1 1 |
| | DESCRIPTION: SPECTRUM NO. 6 WITH P _{CLIP} > 17.942 PSI. | FLIGHT HOURS TOTAL CYCLES RANGE TRUNCATION (PSI) HIGHEST PEAK (PSI) |

FLIGHTS = 2,422 LANDINGS = 3.843
AVERAGE NO. OF CYCLES PER: FLIGHT = 69.5
FLIGHT HOUR = 67.3
SMALLEST VALLEY (PSI) = 0

TABLE B-92 SPECTRUM BS6.CLP3 (NO. 92)

DESCRIPTION: SPECTRUM NO. 6 WITH $P_{CLIP} \leqslant 0$ PSI.

FLIGHT HOURS = 2,500

TOTAL CYCLES = 168,198

RANGE TRUNCATION (PSI) = 4,000
HIGHEST PEAK (PSI) = 23,923

| = | | | | | | | | | | | | 0 | 10018 | 011 | 243 | 762 | 3/4 | 36/ // | 67/67 | 56,113 | 67, (3) | 834 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | |
|---|--------------------|----------------------------|----------|---------|------------------------|---------------------------------|---|--|--|--|--|--------|--------|--|--|--------|--|--------|--------|--------|---------|--|---|---|--|--|--|--|--|--|--|--|--|--------|--|--|--|---|--|--------|--------|--------|-------|---|-------|
| × | | 5.7 | 7.1- | 0.1- | 6 | 0,1 | 1: | 9. | | 4 | | 2 | 7 | 0 | - | .2 | .3 | 4. | 5. | 9 | 1 | . 0 | 0.0 | | 0 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 0 | 7430A | 61,428 | 20.740 | 2800 | 1117 | 1266 | 1070 | 200 | 270 | 187 | 20/ | 252 | 33 | 2 | 0 | 3 | 0 | | | | | | | | | | | | | | | | | | | | | | |
| Kange (ps1) | | | | 000 | 2,000 | 3,000 | 000,4 | 2,000 | 000.0 | 2,000 | 8,000 | 000.6 | 10,000 | 11,000 | 12,000 | 13,000 | 14,000 | 15,000 | 16,000 | 17.000 | 18,000 | 000 | 000.65 | 000,02 | 000,12 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 | 28,000 | 29,000 | 30,000 | 31,000 | 32,000 | 33,000 | 34,000 | 35 000 | 200 | | | | | |
| - | | T | | T | | | | | | | | | T | | | | | 0 | 384 | 358 | 43 | 246 | 4,197 | 17,220 | 34.344 | 31.833 | 36.06/ | 1100 | 26 378 | 1,038 | 575 | 186 | 197 | 13 | 2 | | 7 | | | 0 | | | | | |
| Peak (ps1) | 1 | -12,000 | 000 | -10,000 | 000.6- | -8,000 | -7,000 | 9-000 | 2,000 | -4,000 | -3,000 | -2,000 | -1,000 | 0 | 1,000 | 2,000 | 3,000 | 4.000 | 5.000 | 000 | 2,000 | 000 | 000,000 | 000.6 | 986,01 | 1,000 | 12,000 | 13,000 | 14,000 | 15,000 | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 21,000 | 22.000 | 23.000 | 24 000 | 25,000 | 26,000 | 000,50 | 7,000 | | |
| DE LA COLOR DE LA | half manage (part) | v II (red) abitum II (red) | S.1- 000 | 000 | 0001.51.000 - 1.0001.0 | 2000 1,000 1,000 2,000 | 000 1, 000 1, 000 2, 000 3, 000 3, 000 9. 9 | 000 1,000 2,000 -1.0 000 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 | 000 1, | 000 1,000 1,000 2, | 000 000 000 000 000 000 000 000 | 000 | 000 | 000 000 000 000 000 000 000 000 | 000 1,000 1,000 1,000 2,000 3,000 4,000 5,000 6,000 7,326 6,000 7,326 6,000 7,326 6,000 7,326 6,000 1,00 | 000 | 000 000 000 000 000 000 000 000 | 000 | 000 | 000 | 000 | 1000 1,000 | 1000 1000 | 1000 1000 | 1000 1,000 | 000 000 000 000 000 000 000 000 | 1000 1,000 | 1000 1,000 | 1000 1,000 | 1000 1,000 | 1000 1,000 | 1000 1,000 | 1000 1,000 | 1000 | 1000 1,000 | 1000 1,000 | 1000 1,000 | 1000 1000 | 1000 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1000 1000 | 1,000 |

| DISTRIBUTION | u | 772 | 969 | | | 864 | C6h | | | | | - | | 64 | | 64 | 611 | 243 | 25. | 3,146 | 16,100 | | 84,735 | | 0 | 0 | 13,446 | | | | - | | | | | _ | | _ | | | | | | | _ | _ |
|---------------------------------------|-------------|-----|---------|---------|----------|------|--------|--------|--------|--------|-------|-------|-------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|
| N N N N N N N N N N N N N N N N N N N | n | | | -1.2 | 0.1- | | 0 | 74.963 | T. | Т | 5 | 7 | 2,489 | 928 | 752 | 82 | 14 | | | Γ | | 31 | | | 435 | | | 451 | LI LI | 369 | 20 | 167 | 42 | , | , | 0 | | | | | | | | | | |
| KWIGE DISTRIBUTION | Range (psi) | | | | 1.000 | 0000 | 2,000 | 3,000 | 4,000 | 5,000 | 000 | 7 000 | 0000 | 000 | 0000 | 000.01 | 000.51 | 000.21 | 13,000 | 14,000 | 000.61 | 000.01 | 000,71 | 000,81 | 000,61 | 000,02 | 22,000 | 000,52 | 24,000 | 25,000 | 26 000 | 27,000 | 28 000 | 20 000 | 20,000 | 31,000 | 32,000 | 35,000 | 33,000 | 34,000 | 35,000 | | 1 | | | |
| 101100 | U | 0 | 47 | | 0 | 0 | 0 | 701 | 77/6 | 1000 | 1,313 | 3,084 | 7,026 | 736 | 45 | 2 | 0 | 0 | 0 | 0 | 384 | 358 | 95 | 246 | 4,197 | 17,220 | 34,344 | 31,833 | 36,061 | 9'0'6 | 26,378 | 6,358 | 1,565 | 473 | 0 | | | | | | | | | | | |
| PEAK DISTRIBUTION | Peak (psi) | | -12,000 | -11,000 | -10 000- | 000 | -9,000 | -8,000 | -7,000 | -6.000 | 5 000 | 000 | 2000 | 2000 | 500.7- | 000.1- | 000 | 000,1 | 2,000 | 3,000 | 4,000 | 000,6 | 200.0 | 200, | 8,000 | 000,60 | 000,01 | 000,55 | 12,000 | 14,000 | 15,000 | 16,000 | 17,000 | 000 | 0000 | 000 | 20,000 | 000,12 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 27,000 | - | |

TABLE B-93 SPECTRUM BS6.CLP4 (NO. 93)

DESCRIPTION: SPECTRUM NO. 6 WITH $P_{CL,IP} \leqslant -5,000 \ \text{PSI}.$

| LIGHT HOURS | ** | 2.500 | FLIGHTS = 2.422 | LANDINGS | H | 3,843 |
|------------------------|----|---------|----------------------------|-------------------------|-----|-------|
| TOTAL CYCLES | # | 177.893 | AVERAGE NO. OF CYCLES PER: | R: FLIGHT | | 73.5 |
| SANGE TRUNCATION (PSI) | н | 4.000 | | FLIGHT HOUR = | B = | 71.2 |
| HIGHEST PEAK (PSI) | 11 | 23.923 | SMALI | SMALLEST VALLEY (PSI) = | = = | 5.000 |

| | PEAK DISTRIBUTION | SUTION | RANGE DISTRIBUTION | UTION | R DIST | DISTRIBUTION |
|--|-------------------|--------|--------------------|--------|--------|--------------|
| 2 962 2,000 2, | 1 1 | c | | - | æ | c |
| 000 2,962 1,000 2,962 1,000 2,000 | | | | | | |
| 1,000 2,982 1,000 2,00 | -12,000 | | | | | |
| 1,000 4,509 -1,0 | -11,000 | | 0 | | -1.2 | 0 |
| 2,000 2, | 10,000 | | 000 | (2,982 | | 102 |
| 2 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 | 000 | | 000 | 6,039 | 0.1 | 82 |
| 1000 | 000.6- | | 2,000 | K 677 | 6. | 17 |
| 4,000 74,036 -2,6 | -8,000 | | 3,000 | 110 | 0 | 00 |
| 2,962 6,000 6,236 6,000 6,236 6,000 6,236 7,000 6,237 8,000 10,000 | -7,000 | - | 4.000 | 2 | 7 | 0 |
| 2,462 6,739 6,739 6,739 6,739 6,739 10,000 1 | - K 000 | | 5 000 | 74,038 | 4 | 125 |
| 2,962 6,739 8,000 2,000 10 | 000 | 0 | 000 | 61,298 | | 555 |
| 1,000 2,000 1,000 2,00 | 000.6- | 2982 | 0000 | 20794 | | 1972 |
| 1000 | -4,000 | 1 / 20 | 7,000 | 200 | 4 | 1 300 |
| 1000 176 1.0 | -3,000 | 2/01 | 8,000 | 200,0 | 3 | 3401 |
| 1,000 1,025 1,000 1,00 | -2.000 | 179 | 000 | 776 | - 2 | 20 |
| 25 1,000 270 1,000 2,0 | 000 | 54 | 000 | 1,036 | | 63 |
| 1,000 64 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 67 1,000 | 0001- | 2 | 000,01 | 270 | - | 29 |
| 12,000 12,000 13,000 13,000 14,000 14,000 15,000 1 | 0 | (| 000 | 000 | 0 | 011 |
| 3,000 68.9 3,000 68.9 3,000 68.9 3,000 68.9 3,000 68.9 3,000 68.9 3,000 68.9 3,000 68.9 3,000 68.9 3,000 68.9 3,000 68.9 3,000 68.9 3,000 69.9 3,000 69.9 3,000 69.9 3,000 69.9 3,000 69.9 3,000 69.9 3,000 69.9 3,000 69.9 3,000 69.9 69.9 3,000 69.9 | 000. | 3 | 12,000 | 601 | - | |
| 1,000 365 356 35 | 2 000 | 0 | 13 000 | 108 | 2 | 643 |
| 264 15,000 3,65 | 000 | 0 | 300 | 183 | , , | 793 |
| 1,000 669 56 | 3,000 | 0 | 4,000 | 36.5 | 2. | 3.155 |
| 16,000 529 16,000 16,000 16,000 176 | 000.4 | 280 | 15,000 | 678 | 4. | 11 120 |
| 17,000 25,74 18,000 176, 18 19,000 176, 18 | 2.000 | 000 | 16,000 | 100 | .5 | 20,00 |
| 245 | 000 | 250 | 17,000 | 254 | 9 | 25,113 |
| 2 | 000 | 56 | 000 | 192 | | 89,731 |
| 4,497 10,000 249 1,000 249 1,000 249 1,000 249 1,000 249 1,000 249 1,000 249 1,000 249 1,000 249 1,000 249 1,000 249 1,000 24,000 2 | 000 | 246 | 000.01 | 776 | | 839 |
| 1.0 | 8,000 | 4.197 | 000,61 | 249 | 0 | 0 |
| 34/344 21,000 5 | 3,000 | 17.220 | 20,000 | 33 | 6. | C |
| 25,000 C 25,000 C 35,004 C 26,006 C 26,000 C 26,000 C 27,000 C 27,000 C 28,000 C 28,000 C 28,000 C 31,000 C 31,000 C 31,000 C 32,000 C 33,000 C 34,000 C 34,000 C 35,000 C 36,000 C 36,000 C 37,000 | 10,000 | 347 | 21,000 | 3 6 | 0. | 2010 |
| 35.000 26.016 26.23 26.000 26.23 27.000 26.23 27.000 27.000 27.000 27.000 28.000 4 33.000 6 34.000 6 34.000 7 35.000 7 37.000 8 37.000 8 37.000 9 37.000 | 11,000 | 27,344 | 22,000 | 2 | | 2,613 |
| 26,067 26,376 26,376 26,376 26,286 27,000 | 12 000 | 31,833 | 22 000 | 0 | | |
| 24,000 26,376 26,376 26,000 27,000 27,000 27,000 27,000 27,000 28,000 4,300 63,000 63,000 7,64 7,77 83,000 63,000 7,87 83,000 7,97 83,000 83,000 1,0 | 12,000 | 36.061 | 23,000 | 3 | | |
| 26,378 6,028 6,028 7,545 7,745 7,745 7,745 7,747 7,747 7,747 7,747 | 13,000 | 2100 | 24,000 | | | |
| 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 14,000 | 010 | 25,000 | | | |
| 7 2 6 2 7 7 7 8 7 2 7 7 7 8 7 2 7 7 7 8 7 2 7 7 7 7 | 15.000 | 0/0'97 | 26.000 | | | |
| 0 / 25 C / 29 / 2 C / 29 / 2 C / 29 / 2 C | 16 000 | 6,028 | 27 000 | | | |
| 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 000 | 1,565 | 000,13 | | | |
| 63 /67 | 000. | 181 | 28,000 | | | |
| 0 - 6 6 6 5 5 | 18,000 | 197 | 29,000 | | | |
| 0 - 0 - 6 | 19,000 | () | 30,000 | | | |
| 250-0 | 20.000 | 0 | 31,000 | | | |
| 20-0 | 21 000 | 9/ | 32 000 | | | |
| 9 -0 | 22000 | 7 | 333,000 | | | |
| -0 | 000,22 | 3 | 33,000 | | | |
| 98 | 23,000 | 1 | 34,000 | | | |
| 0 | 24,000 | | 35,000 | | | |
| 27,000 | 25,000 | 0 | | | | |
| 27,000 | 27,000 | | | | | |
| 000',7 | 200,24 | | | | | |
| | 000'7 | | | | | |
| | | I | | | | |
| | 1 | 1 | 1 | | | |

* CYCLES WITH RANGE < 4,000 PRODUCED BY CLIPPING AFTER THE BANGE TRUNCATION.

TABLE B-94 SPECTRUM BS6.MISC1 (NO.94)

| DESCRIPTION | SPECTRUM NO. 6 WITH FLIGHT INCREMENTAL LOADS AVERAGING |
|-------------|--|
| | INTERVAL $\Delta g = 0.05$. |

| 1,000 | 1,000 1,00 | 1000 | 1,000 1,00 | PEAK DISTR | DISTRIBUTIO: | RALGE DISTRI | DISTRIBUTION | R DIST | DISTRIBUTION |
|--|--|--|--|------------|--------------|--------------|--------------|--------|--------------|
| 1,000 1,00 | 000 1 | 1,000 1,00 | 0 | Peak (psi) | C | Pange (psi) | c | C.E. | c |
| 1,000 1,00 | 1000 | 1,000 1,00 | 1,000 1,00 | 1 | 0 | | T | | 766 |
| 1,000 | 1,000 | 0 | 1,000 | -12,000 | 6 | | | 5.7 | 729 |
| 1,000 | 1,000 1,00 | 74 3,000 22,2525 2,346 6,000 22,2525 2,346 6,000 22,2535 2,346 6,000 2,2743 10,000 2,2743 10,000 2,2743 10,000 2,2743 10,000 2,2743 10,000 2,2743 10,000 2,2743 10,000 2,2743 10,000 2,2743 10,000 33,73 | 1,000 1,00 | 000'11- | 0 | | | -1.2 | 189 |
| 1,200 1,00 | 1,000 2,00 | 1,000 1,00 | 1,207 1,000 1,00 | -10,000 | 7 | 1,000 | | 0.1- | 200 |
| 159 150 | 159 3,000 42,25.7 1.5 | 159 3,000 42,25.5 5,000 62,25.5 5,000 62,25.5 6,000 62,27.5 62,000 62,27.5 6 | 1000 | 000.6- | 14 | 000.2 | | 6:- | 573 |
| Tee 5,000 C4,1/5 C5 C5 C5 C5 C5 C5 C5 | Tee 5,000 52,257 | 766 5,000 62,257 7.6 7.00 76,1/15 7.5 7.00 76,1/15 7.5 7.00 76,1/15 7.5 7.00 76,1/15 7.5 7.00 76,1/15 7.5 7.00 76,1/15 7.5 | 766 5,000 26,757 -16 | 2,000 | 1.59 | 3,000 | O | 100 | 089 |
| 1000 | 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | 2,3% 2,3% 2,8¢() 2,6¢() 2,6¢() 2,6¢() 2,6¢() 2,100 2,279 2,100 2,279 2,100 2,279 2,100 2,279 2,100 2,279 2,100 2,279 2,100 2,279 2,100 2,279 2,200 2,279 2,200 2,279 2,200 2,279 2,200 2,279 2,200 2,2 | 2,3% 2,3% 2,6% 2,6% 2,6% 2,6% 2,6% 2,0% 2,7% 2,1% 2,0% 2,1% 2,1% 2,1% 2,1% 2,1% 2,1% 2,1% 2,1 | 000. | 168 | 000, | 92,25 | 1:- | 325 |
| 1000 | 1000 | 2,667 6,/35 6,000 6,735 6,000 6,735 10,000 6,665 11,000 12,000 13,000 12,000 13,000 12,000 13,000 14,000 15,000 16,000 17,000 18,000 18,000 18,000 19,000 10,00 | 1,000 1,476 1,5 | 000 | 2,346 | 0000 | 511.95 | | 201 |
| 1,000 6,257 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,27 1,000 6,267 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 | 1,000 6,265 1,000 6,265 1,000 6,265 1,000 6,265 1,000 6,267 1,000 1,00 | 1,000 6,265 1,000 6,265 1,000 6,267 1,000 1,00 | 1,000 6,255 1,000 6,265 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,267 1,000 6,27 1,000 6,27 1,000 6,27 1,000 6,27 1,000 6,27 1,000 6,27 1,000 6,27 1,000 6,27 1,000 6,27 1,000 6,27 1,207 1,000 1,007 1,207 1,207 1,000 1,007 | 000.6- | 2,801 | 000,000 | 16,918 | : | 89 |
| 1,1,6 0,000 2,279 1,2 0,000 2,279 1,2 0,000 2,279 1,2 0,000 2,2 2,2 0,000 2,2 2,2 2,2 2,2 2,2 2,2 2,2 2,3 2,4 2,5 | 1,1,6 0,000 2,279 1,1,000 2,279 1,1,000 2,279 1,1,000 2,279 1,1,000 2,279 1,1,000 2,279 1,1,000 2,279 1,1,000 2,279 1,2,000 2,279 1,2,000 2,2,279 1,2,000 2,2,279 1,2,000 2,2,279 2,2,000 2,2,279 2,2,000 2,2,279 2,2,000 2,2,279 2,2,000 2,2,279 2,2,000 2,2,279 2,2,000 2,2,299 2,2,29 | 1,1,6 0,000 2,279 1,000 2,279 1,000 2,279 1,000 2,279 1,000 2,279 1,000 2,279 1,000 2,279 1,000 2,279 1,000 2,279 1,000 2,279 2,000 2,00 | 1,1,6 0,000 2,279 1,1,000 2,279 1,1,000 2,279 1,1,000 2,279 1,1,000 2,279 1,1,000 2,279 1,1,000 2,279 1,1,000 2,2 1,2,000 1,2,279 1,2,000 1,2,279 1,2,000 1,2,279 1,2,000 1,2,279 1,2,000 1,2,279 1,2,000 1,2,279 1,2,27 | 000.4 | 6/35 | 000. | 8,205 | 4 | 55 |
| 1000 2c7 2c7 1000 2c7 | 1000 2c7 | 1000 207 1000 207 1000 207 1000 207 1000 207 1000 207 1000 207 1000 207 1000 207 1000 207 | 1,000 2c7 0,000 2c7 2c7 0,000 2c7 2c7 2c7 0,000 2c7 | -3,000 | 1.116 | 000.8 | 2.279 | 7 | 47 |
| 0,000 2e7 0 0 0 0 0 0 0 0 0 | 0,000 267 0 0 0 0 0 0 0 0 0 | 0,000 2e7 0 0 0 0 0 0 0 0 0 | 0,000 267 0 0 0 0 0 0 0 0 0 | - 2,000 | 27 | 000.6 | 8Ch | 7 | 57 |
| 1,000 77 0 0 0 0 0 0 0 0 | 1,000 77 0 0 0 0 0 0 0 0 | 1,000 77 0 0 0 0 0 0 0 0 | 1,000 77 0 0 0 0 0 0 0 0 | -1,000 | | 10,000 | 207 | 7 | 76 |
| 1,000 4¢ 1,000 52 1,000 1, | 1,000 4¢ 1,000 | 1,000 4¢ 1,000 | 1,000 4¢ 1,000 | 0 | | 000,11 | 77 | 0 | hni |
| 3,000 22 3 4 4 5 5 5 5 5 5 5 5 | 1,000 22 34 36 35 36 37 37 37 37 37 37 37 | 3,000 22 3,000 72 3,000 72 3,000 72 3,000 72 5,000 72 5,000 72 5,000 72 6,000 72 7,000 747 6,000 747 7,000 747 7,000 747 7,000 747 7,000 747 7,000 747 7,000 747 7,000 747 7,000 747 7,000 747 7,000 747 7,000 747 7,000 747 7,000 747 7,000 747 7,000 747 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 7,000 8,000 7,000 9,000 7,000 . | 1,000 22 34 36 36 36 36 36 37 36 37 37 | 1,000 | 0 | 12,000 | 94 | - | 232 |
| 1,000 12 13 14 15 15 15 15 15 15 15 | 1,000 72 | 1,000 72 | 1,000 72 | 2,000 | C | 13,000 | 22 | .2 | 279 |
| 15,000 | 15,000 | 15,000 | 15,000 | 3,000 | | 14,000 | /2 | | 3 223 |
| 1,000 1,00 | 1,000 1,00 | 1,000 1,00 | 1,000 1,00 | 4,000 | 364 | 15,000 | 12/ | 4. | 16.028 |
| 1,000 34 .5 .5 .5 .5 .5 .5 .5 . | 1,000 34 15 16 16 16 16 16 16 16 | 1,000 34 1,000 34 1,000 34 1,000 34 1,000 34 1,000 34 1,000 34 1,000 34 1,000 34 1,000 34 1,000 34 1,000 34 1,000 34 1,000 34 34 34 34 34 34 34 | 1,000 34 15 16 16 16 16 16 16 16 | 2,000 | 33/ | 16,000 | 9 | J. | 57 974 |
| | | | | 000,9 | 93 | 17,000 | 36 | 9: | 83 948 |
| \$\frac{5}{6}\trac{5}{6}\trac{5}{1}\trac{1}\trac{1}{1}\trac{1}\trac{1}{1}\trac{1}{1}\trac{1}\trac{1}{1}\trac{1}\trac{1}{1}\trac{1}\trac{1}{1}\trac{1}{1}\trac{1}\trac{1}{1}\trac{1}\trac{1}\trac{1}{1}\trac{1}\trac{1}\trac{1}\trac{1}\trac{1}\trac{1}\trac{1}\trac{1}\trac{1}\trac{1}\trac{1}\trac{1}\trac{1}\trac{1}\trac{1}\ | 1,000 1,26 1,000 1,26 1,000 1,26 1,000 | 1,000 1,26 1,26 1, | 1,000 1,26 1,000 1,26 1,000 1,26 1,000 1,26 1,000 | 000. | /2/ | 000.8 | 95 | 1. | 784 |
| 1,25¢ 20,000 472 1.9 1.0 | | 1,254 2,000 472 1.9 1.0 | | 8,000 | 5,405 | 000,61 | /28 | 0 | 0 |
| 26,727 21,000 | 26,727 21,000 | 26,727 21,000 | 26,727 21,000 | 000.6 | 11.256 | 20,000 | 472 | 6. | C |
| 2,6,706, 23,000 94,3 -2,6,25 24,000 84,3 -6,2,664 25,000 837 -6,2,664 26,000 1667 -6,2,664 26,000 167 -6,2,664 26,000 167 -7,000 33 -7,000 33 -7,0 | 2,6,706, 23,300 94,3 2,7,6.25 24,000 94,3 2,7,6.25 24,000 83.7 6,3.06 25,000 83.7 6,3.06 27,000 107 6,3.06 27,000 107 7,23 30,000 2 7,30,000 2 7,30,000 2 7,30,000 2 8,000 33 7,30,000 2 8,000 33 9,000 2 7,300 33 9,000 2 7,300 33 9,000 2 9,000 33 9,000 34 9,000 34 9,000 35 9,000 35 9, | 2 26,706 22,000 94.3 | 2 26,906 23,000 943 | 10,000 | 26.721 | 51,000 | 1.163 | 1.0 | 13461 |
| 23,000 46,656 4,6656 6,366 6,366 7,207 7,20 7,000 1,207 | 23,000 4,505 6,206 6,206 7,000 9,000 9 | 23,000 46,558 4,000 4,207 6,208 6,208 7,000 7,207 1000 7,207 1000 7,300 7, | 23,000 4,000 4,200 6,300 7,207 7,207 1 | 11,000 | 28 904 | 22,000 — | 9003 | | |
| 24,000 (2,500) (2,500) (2,500) (2,500) (2,500) (2,500) (2,500) (2,500) (3,500) (47) (| 24,000 2,508 1,208 1,208 1,208 1,208 1,207 28,000 1,207 28,000 1,23 1,000 1 | 24,000 6,368 25,000 6,368 25,000 6,368 25,000 7,207 28,000 7,207 28,000 7,300 7,31,000 7,33,000 7,33,000 7,33,000 35,500 35,500 | 24,000 2,508 2,508 1,208 1,208 1,207 28,000 1,207 28,000 1,207 1,000 | 12,000 — | 2000 | 23,000 | 34.7 | | |
| 25,000 6,306 6,306 7,207 7,300 7,300 7,31,000 7,31,000 7,31,000 7,31,000 7,31,000 7,31,000 8,000 9,00 | 25,000 6,306 6,306 7,207 7,300 7,300 7,31,000 7,32,000 7,33,000 7,30,000 7,30,000 7,30,000 7,30,000 7,3 | 25,000 6,306 6,306 6,306 7,207 7,207 12,300 17,300 17,300 17,300 18,000 18,000 19, | 25,000 6,306 6,306 7,504 7,504 7,900 7 | 13,000 | 95 37 | 24,000 | 5 3 | | |
| 7 33,000 35,000 | 7 33,000 7,207 7,207 1,207 | 7 32,000 6,206 6,206 7,207 7,300 7,700 7,700 7,700 7,700 7,700 7,700 7,700 7,700 7,700 7,700 8,000 7,700 7,700 9,000 7,700 9,000 7,700 9,000 | 7 2000 6,300 6,300 7,207 1,207 1,207 1,207 1,207 1,000 1,207 1,000 1 | 14,000 | 10,030 | 25,000 | 121 | | |
| 7, 200 7,207 28,000 7,23 30,000 7,33,000 7,33,000 7,33,000 9,34,000 9,35,500 | 7,000 7,207 28,000 7,23 10,000 7,31,000 7,32,000 7,33,000 7,33,000 7,34,000 7,34,000 7,34,000 7,35,000 7,35,000 7,37,000 | 7,200 7,207 7,207 1,207 1,207 1,200 1, | 7,000 524 28,000 728 29,000 77 1000 7 31,000 7 32,000 35,500 | 15,000 | 1,00.7 | 26,000 | 100 | | |
| 1,240 28,000 1,240 1,240 1,400 1,4 | 7 28,000 728,000 729,000 73,000 73,000 73,000 73,000 73,000 73,000 73,000 73,000 73,000 | 7 33,000 7 33,000 7 34,000 35,500 | 1,29 | 16.000 | 6,300 | 27.000 | 106 | | |
| 7 33,000 7 32,000 7 31,000 7 32,000 7 33,000 8 34,000 9 35,500 | 7 33,000 7 33,000 7 33,000 8 34,000 9 35,500 | 254 723 30,000 47 31,000 32,000 34,000 35,500 | 7 33,000 7 7 31,000 7 7 31,000 7 32,000 7 33,000 9 34,000 135,500 | 17.000 | 1021 | 28,000 | 101 | | |
| 7 30,000 7 31,000 7 33,000 7 33,000 9 34,000 15,500 | 7 30,000 7 31,000 7 33,000 7 33,000 7 33,000 8 34,000 9 34,000 | 7 30,000 7 31,000 7 33,000 9 34,000 9 35,000 | 7 30,000 7 31,000 7 33,000 7 33,000 8 34,000 9 34,000 9 35,500 | 000 | 526 | 2000 | 33 | | |
| 7 31,000 7 32,000 7 33,000 7 34,000 8 5,000 | 7 33,000 7 33,000 7 33,000 7 34,000 7 35,500 | 7 33,000 7 33,000 7 33,000 7 34,000 15,500 | 47 31,000 7 32,000 7 33,000 7 33,000 7 34,000 7 34,000 7 35,500 | 000 | 123 | 000.62 | 2 | | |
| 7/ 00 | 7, 00 | 7/ 0 | 9/ 0 | 000.61 | 47 | 30,000 | 0 | | |
| , no | rn0 | rno | | 000,02 | 1/ | 31,000 | | | |
| no | no | no | n 0 | 21,000 | 7 | 32,000 | | | |
| 0 | 0 | 0 | 00 | 22,000 | - | 33,000 | T | | |
| | | 5 | 5 | 23,000 | 3 | 34.000 | I | | |
| | | | | 24,000 | 2 | 35,500 | | | |
| | 26,000 | 26,000 | 24,000 | 25.000 | | - | | | |
| | | 2000 | 27,000 | 2000,94 | | | | | |

TABLE B-95 SPECTRUM BS6.MISC2 (NO. 95)

DESCRIPTION: SPECTRUM NO. 6 WITH FLIGHT INCREMENTAL LOADS AVERAGING INTERVAL $\Delta_g = 0.20.$

= 2.500 = 375.893 = 4.000 = 24.790 RANGE TRUNCATION (PSI) = HIGHEST PEAK (PSI) FLIGHT HOURS TOTAL CYCLES

FLIGHTS = 2,422
AVERAGE NO. OF CYCLES PER: FLIGHT 2,422

3,843 155.2 150.4 -24,298 FLIGHT HOUR = SMALLEST VALLEY (PSI) =

DISTRIBUTION

œ

RANGE DISTRIBUTION Range (psi)

PEAK DISTRIBUTION Peak (psi)

TABLE B-96 SPECTRUM BS6.MISC3 (NO. 96)

DESCRIPTION: SPECTRUM NO. 6 250 FLIGHT HOUR SEQUENCE

RANGE TRUNCATION (PSI) = HIGHEST PEAK (PSI) FLIGHT HOURS TOTAL CYCLES

= 250 = 18,210 = 4,000 = 20,710

AVERAGE NO. OF CYCLES PER: FLIGHT 243 FLIGHTS =

LANDINGS = 388
FLIGHT = 71.9
FLIGHT HOUR = 72.8
ST VALLEY (PSI) = -16.724

SMALLEST VALLEY (PSI) =

DISTRIBUTION

œ

7,506 RANGE DISTRIBUTION 22.2000 24.2000 25. 30 PEAK DISTRIBUTION Peak (psi -12,000 -11,000 -10,000 -2,000 -2,000 -4,000 -2,000 -1,000 -1,000

790 34 353

40 25,000 27

1,242 2,164 23,780 25,610 303,853 395

81.004.01.01.044.07

433

1,681

22 22 6

0 0 14.196

800

1,000 4,000 4,000 1,

0 280 280 294 120 2541 3, 126 9, 208 1, 208 25, 149 3, 168 25, 149 3, 168 3, 16

363 30 30

5,254

:400

15

2/5

3,439 2,154 3,603 2,638 2,638 (5) 75

0

161

TABLE B-97 SPECTRUM BS6.MISC4 (NO. 97)

DESCRIPTION: SPECTRUM NO. 6 500 FLIGHT HOUR SEQUENCE.

| SHIGHT HOURS | 16 | 200 | FLIGHTS = 484 LA | LANDINGS | H. | 292 |
|-------------------------|----|--------|-------------------------------|---------------|----|---------|
| TOTAL CYCLES | | 36 303 | AVERAGE NO. OF CYCLES PER: FL | LIGHT | H | 75.0 |
| COUNT TRIBICATION (BEI) | | 4 000 | 4 | FLIGHT HOUR = | | 72.6 |
| KANGE I RUNCATION (FS!) | | 01100 | SMALLEST VALLEY (PSI) = | VALLEY (PS | = | -16.724 |

= 1,250 = 90,995 = 4,000 = 22,694

FLIGHT HOURS

TOTAL CYCLES

RANGE TRUNCATION (PSI) =
HIGHEST PEAK (PSI) =

DESCRIPTION: SPECTRUM NO. 6 1,250 FLIGHT HOUR SEQUENCE

TABLE B-98 SPECTRUM BS6.MISC5 (NO. 98)

| = | K | _ | Range (psi) | U | k (psi) |
|------------|-------|-------|--------------------|--------|-------------------|
| STRIBUTION | R DIS | UTION | RATGE DISTRIBUTION | UT1011 | PEAK DISTRIBUTION |

| Peak (psi) | | | | | |
|------------|--------|-------------|---------|------|--------|
| | 0 | Pange (psi) | c | R | c |
| | | | | | |
| | 0 | | | | 127 |
| -12,000 | 21 | | | 0.0 | 312 |
| -11,000 | - | | | 7.1- | 296 |
| -10,000 | 0 | 1,000 | | 0.1- | 17.57 |
| -0.000 | ,, | 2.000 | | 6 | 100 |
| 000 | 7/ | 3 000 | | 8 | 177 |
| 000.0- | 104 | | 0 | 2. | 362 |
| 000.1- | 777 | 000.4 | 37, 573 | 1:- | 59/ |
| 000.9- | 707 | 2,000 | 23 383 | 0: | 7.5 |
| -5.000 | | 0000.9 | 11000 | 5 | 777 |
| -4.000 | 1,00 | 7.000 | 5,5,0 | 4 | 9 |
| 000 | 3,613 | 0000 | 3,85/ | - 3 | 28 |
| 000.5- | 386 | 000 | 161'1 | | 24 |
| -2,000 | 275 | 3,000 | 528 | 7:- | 3/ |
| -1,000 | 1 | 10,000 | 124 | - | 38 |
| 0 | 2 | 11.000 | 17, | 0 | 200 |
| 1 000 | 0 | 12 000 | 67 | - | |
| 000 | 0 | 000.21 | 18 | | 129 |
| 7,000 | C | 13,000 | 80 | 7. | 39/ |
| 3,000 | | 14,000 | | 7 | 775/ |
| 4 000 | 0 | 15.000 | | 4. | 200 |
| 000 | 180 | 16,000 | 9 | u | 0,166 |
| 2,000 | 172 | 000,00 | 7 | ? " | 26,300 |
| 0000 | 7/7 | 000*/ | 111 | 0.1 | 44,988 |
| 7,000 | 103 | 18,000 | 177 | 1 | 378 |
| 8.000 | 27 | 19,000 | | 8. | - |
| 000 | 2,137 | 20 (300 | 99 | 0 | - |
| 000 | 8,614 | 000 | 210 | | 0 |
| 10,000 | 17,180 | 000,12 | 292 | 2. | 6,836 |
| 1,000 | 15974 | 75,000 | 817 | | |
| 12.000 | 10000 | 23,000 | 101 | | |
| 12 000 | 10,016 | 24.000 | 101 | | - |
| | 4,577 | 000 | 55 | | |
| 14,000 | /3,/30 | 000,62 | 190 | | |
| 15,000 | 3010 | 26,000 | 90 | | _ |
| 16,000 | 782 | 27,000 | 80 | | |
| 17.000 | 100 | 28,000 | 2 | | |
| 1000 | 90 | 29,000 | 2 | | |
| 000 | 66 | 30 000 | 7 | | _ |
| 000,61 | 28 | 000.00 | 0 | | |
| 20,000 | 0 | 31,000 | | | - |
| 21,000 | 1 | 32,000 | | | |
| 22.000 | 100 | 33.000 | | | |
| 22 000 | 7 | 24 000 | | | |
| 0000 | 0 | 000 | | | |
| 74,000 | | 000.65 | | | |
| 25,000 | - | | | | - |
| 26,000 | | | | | |
| 27,000 | | | | | |

| DISTRIBUTION | u | 14 | 722 | 121 | 186 | 16 | 0111 | 011 | 11 | 62 | 11 | 12 | 01 | 12 | 9/ | 22 | 64 | 150 | 59.8 | 3.251 | 10.579 | 016.21 | 65/ | 0 | 0 | 2,709 | | | | | | | | | | _ | | | | | | | _ |
|--------------------|-------------|-----|---------|---------|---------|----------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| K DIST | R | 5 1 | 6 | 7.1- | 0.1- | 6 | 8 | 7 | 9 - | 2 4 | 0 | 4.0 | 3 | 7.5 | - | 0 | - | .2 | .3 | 4. | .5 | 9. | 1. | 8. | 6. | 0.1 | | | | | | | | | | | | | | | | | |
| NOTIO | u | | | | | - | 1 | 0 | 15,085 | 13,221 | 4,930 | 1.542 | 150 | 217 | 20 | a d | 0 | | . ~ | | | 4 | 9 | 30 | 47 | 206 | 161 | 77 | 2/ | 687 | 2 | 92 | 01 | , | 0 | | | | | | | | |
| KALGE DISTRIBUTION | Range (psi) | | | | 000,1 | 2,000 | 3.000 | 4 000 | 000 | 000.6 | 000,0 | 7,000 | 8,000 | 000,6 | 10,000 | 11,000 | 12,000 | 13,000 | 14,000 | 15,000 | 16,000 | 17,000 | 18,000 | 19,000 | 20,000 | 21,000 | 22,000 | 23,000 | 24,000 | 25,000 | 26,000 | 000,12 | 000,000 | 000,67 | 30,000 | 20,000 | 32,000 | 000.00 | 00,40 | 000,00 | | | |
| 01101 | C | 0 | 12 | 0 | - | | 35 | 38 | 183 | 268 | 5% | ימוח | 201 | 50 | 2 3 | 0 | - | T | • | 0 | 9 | 19 | 101 | 728 | 3 457 | 7287 | 285 | 7.185 | 1,8/9 | 142.2 | 1,199 | 308 | 34 | 36 | 11 | 2 | 0 | | | | | | |
| PEAK DISTRIBUTION | Peak (psi) | | -12,000 | -11,000 | -10,000 | -0000-6- | 000 8 | 2000 | 000.7- | -6,000 | -2,000 | -4,000 | -3,000 | -2,000 | -1,000 | 0 | 1,000 | 2,000 | 3,000 | 4.000 | 5,000 | 000.9 | 7.000 | 8,000 | 000,6 | 10,000 | 11,000 | 12,000 | 13,000 | 14,000 | 15,000 | 16,000 | 000,71 | 18,000 | 000,61 | 000,02 | 000,12 | 000,22 | 23,000 | 24,000 | 25,000 | 27,000 | 81,000 |

TABLE 100 SPECTRUM BS1.MISC7 (NO. 100)

TABLE B-99 SPECTRUM BS6.MISC6 (NO. 99)

| DESCRIPTION: A SIMPLIFIED SPECTRUM NO. 6 | IFIED SPECTR | UM NO. 6 | | | | DESCRIPTION: SI | PECTRUM N | SPECTRUM NO. 1 FLIGHT 1. AMPLITUDES DECREASED. | DESCRIPTION: SPECTRUM NO. 1 FLIGHT 1.0g STRESSES INCREASED AND AMPLITUDES DECREASED. | REASED AND | | |
|--|--|--|---|---------------------|--|---|-----------|---|--|------------|---|--|
| FLIGHT HOURS = 2.500 TOTAL CYCLES = 176.77 RANGE TRUNCATION (PSI) = 4.000 HIGHEST PEAK (PSI) = 23.923 | = 2.500 = 176.778 1) = 4.000 = 23.923 | FLIGHTS = 2.422 AVERAGE NO. OF CYCLES PER: FLIGHT FLIGHT SMALLEST VALLEY | 5 | SS HOUR (PSI) | = 3,843 = 73.0 = 70.7 = -11,253 | FLIGHT HOURS TOTAL CYCLES RANGE TRUNCATION (PSI) HIGHEST PEAK (PSI) | | 2,500 42,258 4,000 22,663 | FLIGHTS = 2,528 AVERAGE NO. OF CYCLES PER: FLIGHT FLIGHT SMALLEST VALLE) | 0 | LES PER: FLIGHT = FLIGHT HOUR = SMALLEST VALLEY (PSI) = | |
| | - | | _ | | Γ | CHOIG VAIG | | 20.00 | HOTTIGICATION TOWN | L | OTETOTOTOTO | |

2,528 16.7 16.9 -24,298

| -12,000 -10,00 | Range (ps.1) | | - | |
|---|--------------|---------|------|--------|
| | | - | × | c |
| | | | 5 | |
| | | | -1.2 | |
| | 1,000 | | -1.0 | 0 |
| | 2,000 | | 9 | 5,045 |
| | 3,000 | | -8- | |
| | 4,000 | 103.761 | | |
| | 2,000 | 42 273 | 9 | |
| H | _ | 23 058 | | |
| -2,000 | T | 3,8/8 | 4 | |
| 000, | 8,000 | 0 | 2 | |
| | 000,6 | 17 | 7 | |
| 000, | 000,01 | 7 | : | |
| 000 | 000,11 | 0 | 0. | |
| 000,1 | 12,000 | 7 | | |
| 2,000 | 13,000 | | .2 | > |
| 3,000 | 14,000 | - 0 | .3 | 0 |
| 4,000 | 15,000 | | 4. | 18 379 |
| 2,000 | 16,000 | I | .5 | 827 62 |
| 000,9 | 17,000 | T | 9. | 88 389 |
| 7,000 | 18,000 | 1 | .7 | |
| 8,000 | 19,000 | | 8. | 0 |
| 00006 | Т | , | 6. | 0 |
| 577 | T | | 1.0 | 665 11 |
| T | T | 2 673 | | 10011 |
| T | Т | 2,013 | | |
| + | Т | 3 | | |
| 1 | T | | | |
| 20, | Т | | | - |
| 16,000 | _ | | | |
| + | _ | | | |
| 18,000 | T | | | |
| | T | | | |
| | T | | | |
| 1 | 1 | | | |
| - | T | | | |
| 9 | 34,000 | | | |
| 24 000 | 35,000 | | | |
| 000. | 33,000 | | | |
| 000,53 | | | | |
| 000,93 | | | | |
| 21,000 | | | | |
| | | | | |

TABLE B-101 SPECTRUM BS3.MISC8 (NO. 101)

| HGHT HOURS | н | 293.4 | FLIGHTS = 600 | LANDINGS | н | 009 |
|--------------------------|----|--------|-----------------------------------|---------------------------------|-------|--------|
| TOTAL CYCLES | 11 | 74.887 | AVERAGE NO. OF CYCLES PER: FLIGHT | FLIGHT | н | 124.8 |
| RANGE TRUNCATION (PSI) = | H | 4.000 | | FLIGHT HOUR | UR = | 255.2 |
| HIGHEST PEAK (PSI) | н | 22.003 | SMALLES | SMALLEST VALLEY (PSI) = -14.451 | = (15 | -14.45 |

| -12,000 -11,000 | | | | | |
|--------------------|--------|-------------|--------|----------|--------|
| 12,000 | С | Pange (psi) | c | œ | c |
| -12,000 | | | | | |
| 10,000 | T | | | 5.1 | |
| 10 000 | - | | | -1.2 | 2.8 |
| -10,000 |) : | 1,000 | | -1.0 | 230 |
| -9.000 | 1 | 2,000 | | 6 | 19 |
| 000 | 0 | 3 000 | | 80. | ō |
| 000 | 0 | 000 | 6 | - 1 | 23/ |
| 000'1- | 379 | 000,1 | 24,286 | ,,, | 33 |
| -6,000 | 888 | 2,000 | 35 407 | 0.1 | 9 |
| -5,000 | 3.0 | 000,0 | 10 507 | C | 0 |
| -4,000 | 1/20 | 7,000 | 2 627 | 4 | 1 |
| -3.000 | 1,000 | 8.000 | 6,121 | 3 | , |
| 2000 | 263 | 0000 | 454 | - 2 | 0 |
| 000,2- | 12 | 000 | 463 | | 2 |
| 0001- | 0 | 000.01 | /29 | - 0 | , |
| + | ¥ | 000. | 90 | | (3) |
| 1,000 | I | 12,000 | | - | S |
| 2.000 | I | 13,000 | | .2 | 700 |
| 2 000 | | 14 000 | | 3 | 102 |
| 2000 | | 000 | 2 | | 76/ |
| 0000 | > | 000.61 | , | . | 3,405 |
| 2,000 | | 16,000 | < | 0. | 18.990 |
| 0000.9 | 31 | 17,000 | 30 | 9 | 47 673 |
| 7.000 | | 18,000 | | 1 | 126 |
| 000 8 | 0 | 19,000 | | 8. | |
| 000 | | 00:00 | 0 | - | |
| 000.6 | / | 000 | 23 | | 0 |
| 000,01 | 141.91 | 000.12 | 141 | 0. | 2,925 |
| 000,11 | 6769 | 77,000 | 5// | | |
| 12,000 | 10701 | 23,300 | 3/ | | |
| 13.000 | 0,10 | 24.000 | 2 | | |
| 14 000 | 76-1 | 25,000 | 1000 | - | - |
| 000 | 15,024 | 25 000 | 622 | | |
| 000.61 | 3.049 | 000.07 | 0 | | |
| 16,000 | 700 | 7,000 | 29 | | |
| 17,000 | 22 | 28,300 | 7 | | |
| 18,000 | 100 | 29,000 | 2 | | |
| 19.000 | 90 | 30.000 | 3 | | |
| 000 | 14 | 31 000 | | | |
| 20,000 | 4 | 000,15 | | | |
| 21,000 | 0 | 32,000 | | | |
| 22,000 | 1 | 33,000 | | | |
| 23.000 | - | 34.000 | I | | |
| 000 | 0 | 35 000 | | | |
| 000,47 | - | 200.00 | | | |
| 72,000 | | | | | |
| 26,000 | I | | | | |
| 27,000 | I | | | | |
| 1 | 1 | | | | |
| | | | | | |

| 2.528 | 22.4 | 22.7 | -24.298 |
|-----------------|------------------------------------|---|---|
| - | | B | = |
| LANDINGS | FLIGHT | FLIGHT HOU | SMALLEST VALLEY (PSI) = -24.298 |
| FLIGHTS = 2.528 | AVERAGE NO. OF CYCLES PER: | | SMALLES |
| 2,500 | 56,697 | 4.000 | 22.114 |
| н | | = | н |
| FLIGHT HOURS | TOTAL CYCLES | IGE TRUNCATION (PSI. | IIGHEST PEAK (PSI) |
| | = 2,500 FLIGHTS = 2,528 LANDINGS = | = 2.500 FLIGHTS = 2.528 LANDINGS = 56.697 AVERAGE NO. OF CYCLES PER: FLIGHT = | = 2.500 FLIGHTS = 2.528 LANDINGS = 56.697 AVERAGE NO. OF CYCLES PER: FLIGHT = 4.000 FLIGHT HOUR = 1.000 |

TABLE B-102 SPECTRUM BS1.MISC9 (NO. 102)

| 1,000 | PEAK DISTRIBUTION | BUTIO. | KANGE DISTRIBUTION | 101100 | X 013 | 0151K1001100 |
|--|-------------------|----------|--------------------|--------|-------|--------------|
| 1,000 | | | 1 | e . | æ | C |
| 1,000 2,000 3,000 2, | 1 | | | | | |
| 1,000 2,000 3,000 2,000 3,000 6,3972 6,3972 1,000 1,247 1,000 | | | | | | 260 |
| 1,000 2,000 2,000 3,000 2,000 3,000 2,000 3,000 | 12,000 | | | | 2 | 887 |
| 2,000 2,000 3,000 6,297 6,292 6,292 6,000 6,000 6,292 7,000 1, | 000'11- | | | | 7 | 38 |
| 2,000 2, | -10,000 | | 0000 | | 0.7 | 47 |
| 1,000 22,9% 1,000 1,00 | -0000.6- | | 2,000 | | 6 | 38 |
| \$\begin{array}{c c c c c c c c c c c c c c c c c c c | -8,000 | | 3,000 | | 8:- | 775 |
| \$\begin{array}{c c c c c c c c c c c c c c c c c c c | -7,000 | I | 4.000 | 22916 | 1: | 280 |
| 1,000 1,00 | -0000,9- | (| 2,000 | /3 444 | 9 | 309 |
| 1,000 4,700 1,00 | -2,000 | 2772 | 000,9 | 10 972 | 5 | 70 |
| 1000 154 100 | -4,000 | 1 302 | 7,000 | 2700 | 4 | 25 |
| 1,100 | -3,000 | | 8,000 | 1 500 | 3 | |
| 10,000 | -2,000 | 211 | 000.6 | | 2 | 170 |
| 1,000 52 1,000 | -1,000 | | 10,000 | 100 | 7 | 1 |
| 12,000 52 13 14 15 15 15 15 15 15 15 | 0 | 0 | 11,000 | | 0 | 00 |
| 13,000 20 3 3 3 3 3 3 3 3 3 | 1.000 | | 12,000 | 70 | - | 0 |
| 14,000 20 3 4 4 4 4 4 4 4 4 4 | 2 000 | | 13.000 | 00 | , | 620 |
| 15,000 7 15,000 16,000 16,000 17,000 | 0000 | | 000 1 | 20 | 1 " | 452 |
| 1000 | 000.5 | → | 000 | S | ? • | 989 |
| 1,000 | 4,000 | 0 | 000.00 | (2 | 4. " | 5,266 |
| 1,42 | 2,000 | 499 | 000.4 | 7 | 0. | 21,882 |
| 4.2 18,000 6 3 4 5 5 5 5 5 5 5 5 5 | 6,000 | 0 | 000,71 | 0 | 0,1 | 13,080 |
| 2,769 20,000 /65 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 | 7,000 | 142 | 18,000 | 9 | 7. | 927 |
| 7,499 7,499 1.00 7,594 7,737 22,000 7,659 7,739 23,000 492 7,739 25,000 7,99 7,594 25,000 7,99 7,594 25,000 7,99 7,594 7,000 7,99 7,594 7,000 7,99 7,100 7,99 7,100 7,99 7,100 7,99 7,100 7,99 7,99 7,900 7,99 7,900 7,99 7,900 7,99 7,900 7,99 7,900 7,99 7,900 7 | 8,000 | 2.769 | 19,000 | 184 | 83 | 0 |
| 21,000 | 000.6 | 7.449 | 20,000 | 185 | e: | 0 |
| 7, 297 2,000 4,737 2,000 4,737 2,000 4,250 7,550 7,550 7,550 7,550 7,550 7,550 7,500 7,650 7,750 7 | 10,000 | 5 742 | 21,000 | 1089 | 1.0 | 8797/ |
| 23,000 1,733 1 | 11,000 | 1207 | 22,000 | 477 | | |
| 24,000 7,733 7,564 7,645 7,000 2,4 28,000 1,23 28,000 1,23 29,000 1,4 31,000 6 7,000 1,4 31,000 6 32,000 1,50 | 12,000 | 5777 | 23,300 | 497 | | |
| 25,000 7,554 7,554 7,554 26,000 7,650 7,650 7,650 7,794 7,894 11,000 6,31,000 1,494 13,000 1,794 13,000 1,794 1 | 13,000 | 11 733 | 24,000 | 00 | | - |
| 26,000 274 28,000 274 28,000 28,000 1,43 | 14,000 | 7457 | 25,000 | 0 | | |
| 27,000 27,000 28,000 28,000 28,000 7,000 7,000 13,000 6,000 13,000 13,000 13,000 135,000 | 15.000 | 1,001 | 26,000 | 1 | | - |
| 28,000 26,000 26,000 27,000 28,000 29,000 29,000 20,000 | 16.000 | 000 | 27.000 | ,,, | | |
| 7.55 29,000 7.4 31,000 6 32,000 7 34,000 7 34,000 7 35,000 | 17,000 | 6/7 | 28,000 | 20 | | |
| 30,000 (4) 31,000 (5) 33,000 (7) 33,000 (7) 34,000 (8) 35,000 | 18,000 | 52/ | 29,000 | | | |
| 31,000 | 10 000 | 97 | 30 000 | 2 | | |
| 32,000 | 000 | 1. | 31,000 | , | | |
| 0 | 000,02 | 9 | 000,00 | 0 | | |
| -0 | 7,000 | 1 | 32,000 | | | |
| 0 | 22,000 | , | 33,000 | | | |
| | 23,000 | 0 | 34,000 | | | |
| 25,000 24,000 27,000 | 24,000 | | 35,000 | | | |
| 24,000 | 25,000 | | | | | |
| 27,000 | 26,000 | | | | | |
| | 27,000 | I | | | | |
| | | | | | | |
| | | - | | | | _ |

TABLE B-103 SPECTRUM BS6.MISC10 (NO. 103)

 FLIGHTS =
 2.422
 LANDINGS
 =
 3.843

 AVERAGE NO. OF CYCLES PER:
 FLIGHT
 =
 67.8

 FLIGHT HOUR =
 65.7
 DESCRIPTION: SPECTRUMNO. 6 WITHOUT TAXI, LOADING IMPACT OR GAG CYCLES. FLIGHT HOURS = 2.500

TOTAL CYCLES = 164.228

RANGE TRUNCATION (PSI) = 4.000

HIGHEST PEAK (PSI) = 23.923

TABLE B-104 SPECTRUM BS6.COMB1 (NO. 104)

DESCRIPTION: SPECTRUM NO. 6 WITH DIFFERENT VALLEY/PEAK COUPLING AND RANGE TRUNCATION = 3,500 PSI.

FLIGHT HOURS = 2.500

TOTAL CYCLES = 285.380

RANGE TRUNCATION (PSI) = 3.500

HIGHEST PEAK (PSI) = 23.923

FLIGHTS = 2.422 LANDINGS = 3.843

AVERAGE NO. OF CYCLES PER: FLIGHT = 117.8

FLIGHT HOUR = 114.2

SMALLEST VALLEY (PSI) = -24.298

SMALLEST VALLEY (PSI) = -1,805

DISTRIBUTION × RANGE DISTRIBUTION Pange (psi) 222,000 222,000 222,000 222,000 222,000 223,00 206 1,904 3,245 8,531 773 54 PEAK DISTRIBUTION Peak (psi) 1.1.2.000 1.1.000 1

271

| 1,000 | eak (psi) i n | Range (psi) n | 10110 | | - |
|--|---------------|-----------------|--------|------|--------|
| 1,000 2,000 | | | | | |
| 1,000 2,000 2,000 2,000 2,000 2,000 2,000 1,000 2,000 1, | | | | 2.1. | |
| 1,000 2,000 2,000 1,000 | - | † | T | -1.2 | |
| 2,000 4,000 6, | | 1,000 | | -1.0 | |
| 3,000 6,000 6,000 6,000 1, | - | 2,000 | T | 6 | |
| \$\begin{align*} \begin{align*} \begi | - | 3,000 | 0 | 8: | |
| 5,000 6,000 1, | - | 4,000 | 141 47 | 1:- | |
| 6,000 6,000 1, | | 2,000 | 61113 | 9:- | |
| 7,000 | - | 000.9 | 20.800 | 5 | |
| 8,000 | - | 7,000 | 10000 | 4 | - |
| 9,000 | - | 8.000 | 2,011 | -:3 | 0 |
| 10,000 11,000 12,000 13,000 14,000 15,000 16,000 17,000 18,000 19,000 19,000 10,000 | | 0000 | 1,031 | - 2 | , |
| 11,000 12,000 14,000 15,000 16,000 17,000 18,000 19,000 19,000 21,000 21,000 22,000 23,000 24,000 25,000 26,000 27,000 28,000 29,000 29,000 29,000 29,000 29,000 29,000 20,000 | - | 000 | 406 | 7: | 2 |
| 12,000 14,000 15,000 16,000 17,000 18,000 19,000 19,000 21,000 22,000 23,000 24,000 25,000 27,000 28,000 28,000 28,000 29,000 20,000 20,000 21,000 22,000 23,000 24,000 25,000 26,000 27,000 28,000 | | 2000 | 223 | : | 11 |
| 12,000 | | - 30.E | 57 | 0 | 40 |
| 13,000 | - | 12,000 | 30 | - | 671 |
| 14,000 | - | 13.000 | | 2. | 7011 |
| 15,000 16,000 17,000 19,000 22,000 23,000 24,000 25,000 26,000 27,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 28,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 | | 14 000 | | 1 | 101 |
| 15,000 19,000 19,000 19,000 22,000 23,000 24,000 25,000 25,000 26,000 27,000 28,000 28,000 31,000 31,000 31,000 32,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 | | 000 | ຕ | ? < | 3,192 |
| 17,000 18,000 19,000 22,000 23,000 24,000 25,000 26,000 27,000 28 | | 000.61 | 0 | * | 16,380 |
| 17,000 18,000 19,000 22,000 22,000 25,000 26,000 26,000 27,000 28,000 28,000 28,000 31,000 32,000 32,000 32,000 32,000 33,000 33,000 35,000 | C | Т | | 2. | 52,889 |
| 18,000 19,000 21,000 23,000 24,000 25,000 26,000 27,000 28,000 29,000 29,000 29,000 29,000 29,000 29,000 29,000 29,000 29,000 20,000 | 0 | Т | | 9. | 340.04 |
| 22,000 21,000 22,000 23,000 25,000 25,000 26,000 27,000 28,000 28,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 31,000 | 677 | Т | | 7. | 8/4 |
| 20,000 23,000 23,000 24,000 25,000 26,000 28,000 28,000 31,000 31,000 32,000 33,000 34,000 35,000 | 100, | Т | | 8. | |
| 21,000 23,000 24,000 26,000 26,000 26,000 29,000 31,000 33,000 35,000 35,000 | 4,00 | Т | I | 6. | 0 |
| 22,000 24,000 25,000 25,000 28,000 28,000 31,000 31,000 32,000 32,000 33,000 34,000 | 16,704 | - | | | |
| | 33,227 | | | 2 | |
| | 31.451 | T | | | |
| | 35479 | T | | | |
| | 100 | T | | | - |
| | 20,23 | T | | | |
| | 167 497 | -1 | | | |
| | 160'9 | -1 | | | |
| | 1,562 | _ | | | |
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| ПППП | 4 | 32,000 | | | |
| | , | 33,000 | | | |
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| 1111 | - | 25,000 | | | |
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1,225 4,554 19,096 81,558

384 000

384

12,422 0 54631

950 950 456 456 17 17

610 2,423 26,359 6,494 3,674 154,027 28,107 6,710 1,546 1,546 1,546 1,546 1,546 1,546 1,546

-0

TABLE B-105 SPECTRUM BS6.COMB2 (NO. 105)

TABLE B-106 SPECTRUM BS6.COMB3 (NO. 106)

DESCRIPTION: SPECTRUM NO. 6 WITH DIFFERENT VALLEY/PEAK COUPLING AND RANGE TRUNCATION = 3,000 PSI.

FLIGHT HOURS = 2,422 LANDINGS = 3.84

TOTAL CYCLES = 407.806 AVERAGE NO. OF CYCLES PER: FLIGHT = 168

RANGE TRUNCATION (PSI) = 3,000

HIGHEST PEAK (PSI) = 23,923

SMALLEST VALLEY (PSI) = -24

| FLIGHT HOURS | н | 2,500 | FLIGHTS = 2.422 | LAN | ANDINGS | H |
|--------------------------|-----|--------------|-----------------------------------|---------------------------------|---------------|---------|
| TOTAL CYCLES | н | 311,256 | AVERAGE NO. OF CYCLES PER: FLIGHT | ER: FLIC | SHT | = 128.5 |
| RANGE TRUNCATION (PSI) = | = (| 3.500 (1.15) | | FLIC | FLIGHT HOUR = | " |
| HIGHEST PEAK (PSI) | 16 | 27.512 | SMAL | SMALLEST VALLEY (PSI) = -27,943 | LLEY (PSI | = (|

| 1,000 | PEAK DISTRIBUTION | 10.1 | KANGE DISTRIBUTION | NOT TOO | K 013 | DISTRIBUTION |
|---|-------------------|---------|--------------------|---------|-------|--------------|
| 1,000 1,00 | Peak (psi) | c. | Range (psi) | c | 62 | u |
| 1,000 2,00 | + | T | | | | 900 |
| 1,000 276,76 -1,2 | 12,000 | | | | 2.1 | 107 |
| 1,000 | 000,11 | T | | I | -1.2 | 100 |
| 2000 2769609 3,000 2769609 4,000 2769601 5,204 6,000 23,287 6,000 23,287 7,000 1,278 6,531 8,000 2,000 8,000 2,000 8,000 2,000 12,000 1,278 6,000 12,000 12,000 1,278 6,000 12,000 12,000 1,278 6,000 1,287 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,294 1,000 1,094 | 000,00 | | 1,000 | I | -0.1 | 200 |
| 1,000 2,00 | 0000 | 0 | 2,000 | - | 6 | 940 |
| 1,230 29,7/8 -1,7 | 8,000 | 206 | 3,000 | 278 980 | 8. | 205 |
| 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | 000. | 1230 | 4,000 | 29/78 | | 3/6 |
| 1,273 1,000 32,287 1,000 1,278 1,000 1,0 | 000.9 | 404 | 2,000 | 99504 | 9. | 2/4 |
| 1,000 | 2,000 | 245 | 000,9 | 32 287 | -:5 | 801 |
| 1000 2,0/4 2,0/4 | + | 165 8 | 7,000 | 11.27.0 | 4 | 9 |
| 1,000 2,300 1,000 2,300 1,00 | + | 773 | 8,000 | 2016 | 3 | 67 |
| 10,000 772 10,000 772 10,000 772 10,000 772 10,000 772 10,000 772 10,000 772 10,000 772 10,000 772 10,000 772 10,000 772 10,000 772 10,000 773 10,000 773 10,000 773 10,000 773 10,000 774 10,000 1 | 2,000 | 7 | 00006 | 1.980 | 2 | 17 |
| 1000 1,506 1 | 000 | | 10,000 | 110 | 7 | 9 |
| 12,000 1,0 | 100 | 9 | 11,000 | 9.0 | 0 | 6 |
| 13,000 14,000 15,000 1 | 000.1 | 0 | 12,000 | 0001 | - | 100 |
| 14,000 765 3 3 3 3 3 3 3 3 3 | 2,000 | 0 | 13.000 | 48 | 2 | 442 |
| 1,000 1,00 | 2 000 | 0 | 000 PL | 185 | , , | 1,288 |
| 1,000 52 53 53 53 53 53 53 53 | 000 | 0 | 200 | 170 | | 4,676 |
| 10,000 43 15 15 15 15 15 15 15 1 | 000 | 2/5 | 000,61 | 52 | 4. | 18.801 |
| 1,000 72 | 000.6 | 23/ | 10,000 | 43 | 0. | 82.258 |
| 1,362 19,000 1,23 19,000 1,23 19,000 1,23 19,000 1,23 19,000 1,23 19,000 1,24 1,00 1,24 1,00 1,24 1,00 1,24 1,00 1,24 1,00 1,24 1,00 1,24 1,24 1,00 1,24 1 | 0000 | 175 | 000,71 | 72 | ٩ | 18.382 |
| 19,000 159 19 10 159 19 10 159 19 10 159 19 10 159 19 10 159 19 10 19 10 19 10 19 10 19 10 19 10 19 10 19 10 19 10 19 10 10 | - | 1,362 | 18,000 | 123 | 1. | 241,058 |
| 1.00 28 92c 20,000 284 1.9 1.0 | - | 500 | 19,000 | 159 | 80.0 | 432 |
| | - | 8.926 | 70,000 | 785 | 2. | 0 |
| 3\langle 6\sqrt{C} 2\langle 6\sqrt{C} 2\langl | - | 1167 | 71,000 | 1.0% | 0. | 15.945 |
| 187,6/4 23,006 26,000 | + | 30705 | 22,000 | 100 | | |
| 10,000 1 | - | 27 676 | 23,000 | 202 | | |
| 28,47 28,47 28,000 1587 1587 1587 1787 178 | 1 | 0,00 | 24,000 | 200 | - | |
| 7 000 7 000 1, 587 1, 587 1, 587 1, 587 1, 587 1, 587 1, 587 1, 580 1, 587 1, 580 1, 587 1, 580 1, 500 1, 500 | + | 200,000 | 25,000 | 200 | | - |
| 7.00/ 1.587 1.860 1.86 2.000 1.97 1.000 1.97 1.000 | 1 | 149/07 | 26,000 | 160 | | |
| / 587 28,000 / 97 30,000 / 97 30,000 / 63 31,000 / 7 33,000 / 6 32,000 / 7 33,000 / 7 33,000 | 000 | 1001 | 27 000 | 17 | | |
| /66 20,000 /47 30,000 /6 53 31,000 /6 32,000 /6 33,000 /6 34,000 /6 35,000 | 2000 | 1,587 | 000,73 | /2/ | | |
| 797 23,000 63 31,000 76 32,000 7 33,000 7 33,000 7 35,000 | 000. | 186 | 28,000 | 23 | | |
| 30,000 (6) 31,000 (7) 32,000 (7) 33,000 (8) 34,000 (9) 35,000 | 8,000 | 161 | 29,000 | 7 | | |
| 31,000 4 32,000 6 34,000 0 35,000 35,000 | 000.6 | 13 | 30,000 | | | |
| 9770 | 000.00 | 0 | 31.000 | 0 | | |
| 74-0 | 000 | 9/ | 32 000 | | | |
| 0 - 0 | 000 | 7 | 2000 | | | |
| -0 | 7,000 | 7 | 33,000 | | | |
| .0 | 3,000 | | 34,000 | | | |
| | 4,000 | | 35,000 | | | |
| 27,000 | 5.000 | 2 | | | | |
| 22,000 | 000 % | 1 | | | | |
| | 000 10 | | | | | |
| | 2001 | | | | | |
| | | | | | | |

| 1,000 | PEAK DISTRIBUTION | UTIOI. | RATGE DISTRIBUTION | 6UTION | R DIST | DISTRIBUTION |
|--|-------------------|---------|--------------------|---------|--------|--------------|
| 1000 | Peak (psi) | C | | r. | × | c |
| 1000 | - 14 000 | 0 | | | | |
| 1,000 1,00 | 000 | 14 | | | | 293 |
| 1,000 | 000,1 | 2 | | | , . | 169 |
| 1000 | 000,00 | 7 | 000 | | 7.1. | 5/9 |
| 207 3,000 -2,9 | 0000 | 9/ | 000, | | 0.1 | 863 |
| 1,000 1,00 | 000,6- | 207 | 2,000 | | 5.0 | 487 |
| 100 | 2,000 | 331 | 3,000 | 0 | 0:- | 109 |
| 3,780 5,000 75,876 5 3,780 5,000 75,876 5 3,72 5,000 7,32 5 3,72 5,000 7,32 5 3,000 7,32 5 4,000 7,32 5 1,000 7,32 5 1,000 7,32 5 1,000 7,32 5 1,000 7,32 5 1,000 7,4 5 1,000 7,4 5 1,000 7,4 5 1,000 7,4 5 1,000 7,4 5 1,000 7,4 5 1,000 7,4 5 1,000 7,4 5 1,000 7,4 5 1,000 7,5 | 000'/- | 687 | 4,000 | 1 | 1 | 337 |
| \$\begin{array}{c c c c c c c c c c c c c c c c c c c | 2000 | 3.780 | 2,000 | 75816 | 9 | 101 |
| 1,000 23,529 4 2,027 9,000 2,764 1 1,000 2,764 1 1,000 2,764 1 1,000 2,764 1 1,000 2,764 1 1,000 2,764 1 1,000 2,764 1 1,000 2,764 1 1,000 2,764 1 1,000 2,764 1 1,000 2,764 1 1,000 2,764 1 1,000 2,764 1 1,000 2,764 1 1,000 2,764 1 1,000 2,64 1 | -5,000 | 200 | 0000,9 | 900 | 5 | |
| 1,000 2,767 2,000 2,00 | -4.000 | 2,647 | 7.000 | 25/1/30 | - 4 | 14 |
| 1000 1/3 to 1/3 | 3 000 | 3,105 | 000 | 23,524 | - 3 | 28 |
| 1000 1/35c | 2000 | 372 | 000 | 6,670 | | 64 |
| 1,000 1,350 1,000 1,350 1,000 1,350 1,000 1,350 1,000 1,350 1,000 1,350 1,00 | 000 | 20 | 000.01 | 2,764 | 7:- | 63 |
| 1,000 369 1 1 1 1 1 1 1 1 1 | 000. | , | 000,01 | 1,350 | - | 79 |
| 1,000 73 1,000 74 1,000 75 1,000 | 000 | 0 | 000,11 | 369 | 0. | 611 |
| 13,000 | 000. | 4 | 12,000 | 73 | -: | 243 |
| 1,000 49 1,000 49 1,000 49 1,000 49 1,000 | 2,000 | | 13,000 | 7.0 | .2 | 8/8 |
| 15,000 27 17 19 19 19 19 19 19 1 | 3,000 | 1 | 14,000 | 1,0 | .3 | 2000 |
| 6,000 | 4,000 | | 15,000 | | 4. | 00'0' |
| 17,000 6 17,000 6 17,000 6 17,000 6 17,000 18,000 17,000 18,000 17, | 5.000 | | 16.000 | 72 | .5. | 0000 |
| 100 | 000 | 909 | 17 000 | 6/ | 9 | 55,312 |
| 1,27 19,000 1,6 1,9 1,0 | 000 | 192 | 000 01 | 88 | 0. | 99,259 |
| 100 147 15 15 15 15 15 15 15 1 | 0000 | 121 | 000,00 | L) | | 118,190 |
| 1,0 6,6 1,9 1,0 | 8,000 | 1447 | 000,61 | 9/ | × . | 0 |
| 1,0 | 000,6 | 7.552 | 20,000 | 899 | 6. | 0 |
| 1/1, 536 | - | 765 71 | 7,000 | 13 | 0. | 14.218 |
| 23,776 23,286 75,286 75,000 75,000 7,00 | 0000 | 765 // | 22,000 | 5// | | |
| 135,286 24,000 1 | + | 33 776 | 23,000 | 250 | | |
| | 13,000 | 32 280 | 24,000 | 702 | | |
| 1,5,001 1,5,000 1,5, | 14,000 | 150 000 | 25,000 | 201 | | |
| 27,000 7,476 7,476 28,000 6,34 30,000 7,287 31,000 284 32,000 14 15,000 17,000 18,000 19 | 15,000 | 132,031 | 26,000 | 101 | | |
| 76.65 76.76 76.78 6.34 7.305 7.3 | 16.000 | 8,867 | 27.000 | 478 | | |
| 7,478 | 17 000 | 27,605 | 28 000 | 243 | | |
| 200,000 200 | 000 | 7,678 | 20,000 | 44 | | |
| 7.305 284 31,000 36 32,000 7.7 34,000 6 7 7 7 7 7 10,000 7 10,000 7 10,000 7 10,000 | 000 | 634 | 000,00 | 333 | | |
| 284 33,000 14,000 14,000 17,000 18,000 19,000 1, | 000,60 | 1,305 | 200,000 | 20 | | |
| 36,000 7,000 17,000 17,000 17,000 18,000 1,00 | 000,00 | 284 | 20,000 | 661 | | |
| 23,000 17 34,000 6 34,000 7 4 35,000 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 | 000,12 | 38 | 32,000 | 80 | | |
| 74 34,000 6 35,000 7 36,000 | 000,22 | 13 | 33,000 | 21 | | |
| 35,000 | 23,000 | 14 | 34,000 | In | | |
| 34,000 | 24,000 | 9 | 35,000 | | | |
| 8 - 0 | 25,000 | 7 | 36,000 | | | |
| | 26,000 | 6 | | | | |
| | 27,000 | | | | | |
| 0 | 28,000 | - 6 | | | | |
| | + | 2 | | | | |

TABLE B-107 SPECTRUM BS6.COMB4 (NO. 107)

| AD RANGE | LANDINGS ES PER: FLIGHT FLIGHT HOUR MALLEST VALLEY (PSI) |
|--|--|
| DESCRIPTION: SPECTRUM NO. 6 WITH 10 PERCENT LOWER STRESSES AND RANGE TRUNCATION = 4,500 (0.9) PSI. | FLIGHTS = 2.422 AVERAGE NO. OF CYCLES PER: FLIGHT FLIGHT SMALLEST VALLE' |
| SPECTRUM NO. 6 WITH 10 PERCENT TRUNCATION = 4,500 (0.9) PSI. | 2,500 130,687 4,500 (0.9) 21,531 |
| TRUM | <u>\$</u> |
| DESCRIPTION: SPEC | FLIGHT HOURS = 2,500 TOTAL CYCLES = 130,687 RANGE TRUNCATION (PSI) = 4,500 (0.9) HIGHEST PEAK (PSI) = 21,531 |
| | 3,843 175.6 170.1 -27,943 |
| | |
| ND RANGE | AVERAGE NO. OF CYCLES PER: FLIGHT = 175.6 FLIGHT HOUR = 170.1 SMALLEST VALLEY (PSI) = -27.943 |
| SSES A | ES PER: |
| R STRE | 422 DF CYCLE |
| нісне | FLIGHTS = 2,422 AVERAGE NO. OF C |
| ERCENT PSI. | FLIGHT |
| DESCRIPTION: SPECTRUM NO. 6 WITH 15 PERCENT HIGHER STRESSES AND RANGE TRUNCATION = 3,000 (1.15) PSI. | = 1.500 OTAL CYCLES = 425.270 AANGE TRUNCATION (PSI) = 3,000 (1.15) HIGHEST PEAK (PSI) = 27,512 |
| TRUM NCATIO | <u>(88</u> |
| SPEC | SES CATION K (PSI) |
| DESCRIPTION | FLIGHT HOURS TOTAL CYCLES RANGE TRUNCATION HIGHEST PEAK (PSI) |
| | |

FLIGHTS = 2,422 LANDINGS = 3,843
AVERAGE NO. OF CYCLES PER: FLIGHT = 54.0
FLIGHT HOUR = 52.3
SMALLEST VALLEY (PSI) = -21,868

TABLE B-108 SPECTRUM BS6.COMB5 (NO. 108)

| Peak (ps1) | | 100100100 | - | 10110011101 |
|-------------|----------|-----------|------|-------------|
| 2 2 8 8 8 | Range (p | psi) n | α: | c |
| 7 7 8 8 8 8 | | | T | 406 |
| | T | + | 1.5 | 693 |
| | T | | -1.2 | H29 |
| | T | | 0:- | 844 |
| | T | | T | 777 |
| | 3,000 | | T | 187 |
| | 7 | + | | 2000 |
| | 7 | 192,533 | 7 | 000 |
| | | | 7 | 641 |
| - | | | | 86 |
| | Γ | 2 | | 56 |
| + | Τ | - | Γ | 64 |
| + | Т | 2 732 | 7:- | 49 |
| + | T | - | | 37 |
| 1 | T | 1 | | 011 |
| 1 000 | 1 | |] | 000 |
| 000. | 12,000 | | | 237 |
| 2,000 | 2,500 | 64 | | 898 |
| 3,000 | 14,000 | - | Γ | 3,078 |
| 1 | T | - | T | 13 634 |
| - | T | - | 15: | A CT 2 |
| | | | | 02/100 |
| 422 000.0 | | 80 | 100 | |
| | Г | 2 | | 203, 958 |
| - | - | 21 | 0.0 | 339 |
| 9,000 | 20,000 | 11 | | 0 |
| 1 | | 45 | 2 | 14,921 |
| + | T | | I | |
| + | T | + | I | - |
| | 1 | 109 | I | - |
| | | | - | |
| 14,000 | - | 7 | | |
| 15,000 | _ | - | | |
| - | T | - | | _ |
| + | 7 | - | | |
| + | 29,000 | 1 | | |
| 10 000 | -1 | - | I | |
| ' | _ | 22 | | |
| | 1- | 126 | | |
| | 1 | - | | |
| 22.000 | Т | - | | |
| - | Т | | T | |
| H 000.53 | - | | | |
| 24,000 | 200.00 | - | | |
| 25,000 4 | T | 0 | | |
| | | | T | |
| + | J | - | I | |
| 28,000 | 7 | | T | |
| 0 | - | | | |

| | | 10110011101 | יאומר חו | DISTRIBUTION | 2 | DISTRIBUTION |
|--|----------|-------------|-----------|--------------|-------|--------------|
| 1.00 | + | c | Dange (ps | | ĸ | ני |
| 100 | - | | 1 | | | |
| 1000 | LION CIT | | | | 2 17 | 275 |
| 1,000 1,00 | 2,000 | 0 | | | | 169 |
| 1,000 1,00 | 000 | 2 | | | 7.1. | 557 |
| 2,000 | -10,000 | | -000, | | 0: - | 600 |
| 100 | -9.000 | | 2,000- | | -6:- | 100 |
| 10 10 10 10 10 10 10 10 | 0000 | 0 | 3 000 | 0 | a | 445 |
| 1/2 | 0000 | 0 | 000 | 146'81 | 0. | 299 |
| 3,402 3,403 7,296 -1,5 -1,5 -1,000 3,434 -1,4 -1,5 -1,000 3,434 -1,5 -1,5 -1,000 3,434 -1,5 -1 | 000.1- | 541 | 4,000 | 33.329 | 1 | 344 |
| \$\frac{3\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{3\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{5\frac{40.2}{40.2}}{2\frac{40.2}{40.2}}\$\frac{60.200}{240.2 | -6,000 | 110 | -000,5 | 0 200 | 0 | 116 |
| 1,000 1,316 -1, | -5.000 | 111 | -000-9 | 2 7/1 | 5 | 100 |
| 1,000 1,30 | 000 | 3,403 | 7 000 | 3,434 | - 4 | 64 |
| 1000 301 1000 301 1000 301 1000 301 1000 301 1000 301 1000 301 1000 301 30 | 2000 | 570'9 | 000 | 1,316 | | 24 |
| 1000 69 11 11 11 11 11 11 11 | 2,000 | 264.2 | 0000 | 30/ | | 64 |
| 10,000 1/46 | -4,000 | 77 | 000.6 | 64 | 1 7:- | 63 |
| 1,000 27 1 1 1 1 1 1 1 1 1 | -1,000 | 2 | 10,000 | 47 | 7 | 10 |
| 12,000 | 0 | , | 11,000- | 10 | 0 | 3 6 |
| 1,000 1,00 | 1 000 | 0 | 12 000 | 1.7 | - | 16 |
| 1,000 1,00 | 000.0 | 0 | 000 | 31 | | 172 |
| 4,000 32 3 | 7,000 | 0 | 13,000 | 7 | 7 | 883 |
| 15,000 74 15,000 74 15,000 74 15,000 74 15,000 74 15,000 74 15,000 74 15,000 74 15,000 74 15,000 74,000 75,000 7 | 3.000 | 0 | 14.000- | | ٠. | 1000 |
| 1,000 1,00 | 000 | 00 | 15,000 | 32 | - 7 | 3,44 |
| 179 170 | 000 | 482 | 000 | 62 | | 18,451 |
| 1,000 5/1 7,000 5/1 7,000 5/1 7,000 5/1 7,000 5/1 7,000 | 000.6 | 79 | -000,01 | 701 | | 43,296 |
| 8,3/4 18,000 1,025 1,0 | 000,9 | 1111 | - 000,71 | 115 | 9. | 77 350 |
| 1000 | 7 000 | 7 | 18,000 - | 110 | 1 | 76, 55 |
| S 3/4 15,000 1,62 1.0 | 000 | 9/2 | 1000 | 1,020 | | 45 |
| 1.00 35¢ 1.3 1.0 1.5 | - | 8,314 | 000.60 | 79/1 | 9.0 | 0 |
| 1.00 1.0 | - | 10 683 | 000,02 | 356 | | 0 |
| 25,000 358 125,000 358 125,000 358 125,000 358 125,000 1 | + | 20 3001 | 21,000 | 41 | 10.1 | 13 06 3 |
| 25.00 7.229 7.229 7.229 7.000 7.000 7.000 7.000 7.000 8.000 8.000 8.000 1.000 8.000 9.0000 9.000 9.000 9.000 9.000 9.000 9.000 9.000 9.000 9.0000 9.000 9.000 9.000 9.000 9.000 9.000 9.000 9.000 9.0000 9.000 | 1 | 16,31 | 22,000 - | 14 | - | 290'6' |
| 23, 600 7, 529 7, 529 7, 66, 27, 000 7, 66, 27, 000 7, 29, 000 7, 29, 000 7, 29, 000 7, 29, 000 7, 29, 000 7, 31, 000 8, 31, 000 9, 000 9, 000 1, 000 1 | | 35,107 | 000 | 358 | - | |
| 7,529 7,624 7,662 7,662 2,000 7,7 7,7 29,000 6 31,000 7 33,000 7 33,000 7 33,000 7 33,000 7 33,000 7 33,000 7 33,000 7 7 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 | - | 31,601 | 000.52 | 180 | | |
| 25,000 1,000 1,000 250 26,000 2,000 2,000 2,000 2,000 3, | - | 7.529 | - 000, 42 | 33 | - | |
| 25 000 77 29,000 77 29,000 77 29,000 70 31,000 7 33,000 7 33,000 7 33,000 8 4,000 9 4,000 | 14,000 | 1030 | 52,000 | 2 | - | |
| 27,000 77, 29,000 8,000 8,000 7, 29,000 11,000 7, 33,000 7, 34,000 12,000 13,000 13,000 13,000 13,000 | 15,000 | 1,000 | 26.000 | 2 | 1 | - |
| 255 28,000 7 29,000 7 31,000 7 33,000 9 34,000 9 35,000 35,000 35,000 36,000 37,000 38 | 16 000 | 1,086 | - 100 70 | , | | |
| 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 000.01 | 250 | 000 | 0 | - , | |
| 200000 | 7,000 | 1/2 | 78,000 | | | |
| 0 - 2 0 | 8,000 | 7/ | 7,000 | | • | |
| 0 ~ ~ 0 | 19,000 | 1 | 30,000 | | | |
| N - 0 | 20,000 | 0 | 31,000 | | | |
| -0 | 000 | 2 | 000 | | | _ |
| 0 | 000,12 | , | 32,000 | | - | |
| | 22,000 | - | 33,000 | | | |
| | 23.000 | | 34.000- | | | |
| | 24 000 | | 75 000 | | | |
| 25,000 27,000 | 000,47 | | 2000 | | | |
| 27,000 | 25,000 | | | | | |
| 27,000 | 26,000 | I | | | _ | |
| | 27,000 | 1 | , | | _ | |
| | 1 | | • | | _ | _ |
| | - | Ī | | | | |

TABLE B-109 SPECTRUM BS6.COMB6 (NO. 109)

DESCRIPTION: SPECTRUM NO. 6 WITH 10 PERCENT LOWER STRESSES AND RANGE TRUNCATION = 3.500 (0.9) PSI.

FLIGHTS = 2.422

AVERAGE NO. OF CYCLES PER: FLIGHT = 128.5

FLIGHT HOUR = 124.5

SMALLEST VALLEY (PSI) = -21.868 FLIGHT HOURS = 2.500

TOTAL CYCLES = 311.256

RANGE TRUNCATION (PSI) = 3.500 (0.9)

HIGHEST PEAK (PSI) = 21.531

TABLE B-110 SPECTRUM BS6.COMB7 (NO. 110)

DESCRIPTION: SPECTRUM NO. 88 WITH RANGE TRUNCATION = 3,500 PSI.

FLIGHTS 2,422 LANDINGS = 3,843

AVERAGE NO. OF CYCLES PER: FLIGHT = 128.6

FLIGHT HOUR = 124.6

SMALLEST VALLEY (FSI) = -24,298 FLIGHT HOURS = 2.500

TOTAL CYCLES = 311.433

RANGE TRUNCATION (PSI) = 3.500

HIGHEST PEAK (PSI) = 33.056

| DISTRIBUTION | u | 263 | 673 | 641 | 5/9 | 863 | 181 | 109 | 337 | 161 | 16 | 90 | 97 | 77 | 63 | 98 | L// | 245 | 879 | 3.176 | 75 27 | 2000 | 20,00 | 1.60 | 118,140 | 0 | 0 | 14,218 | | | | | | | | | | | | | | | | | | | | |
|--------------------|-------------|-----|---------|---------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|-----|--------|--------|--------|--------|--------|--------|--------|---------|---------|--------|--------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| R DIST | ď | | -1.5 | -1.2 | 10 | | | 0.1 | 1 | 9 | 5 | 4 | 3 | 2 | - | | 0 - | - 0 | 7. | .3 | 4. | .5 | 9. | 7 | 8 | | | 0.1 | | | | | | | | | | | | | | | | | | | | |
| TION | u | | T | | | | 0 | 131.244 | 373 54 | 45 /47 | 100.00 | 7507 | 1000 | 6077 | 1,033 | 264 | 96 | 47 | 33 | 7/ | 07 | 6, | 20 | 37 | 84 | 115 | 6.52 | 1,036 | 978 | 964 | 127 | 346 | 22 | 153 | 24 | 7 | 1 | 0 | | | | | | | | | | |
| RAGGE DISTRIBUTION | Range (psi) | | | | 1 000 | 000 | 0000 | 3,000 | 4,000 | 2,000 | 0,000 | 7,000 | 8,000 | 000.6 | 10.000 | 11,000 | 000 | 000,21 | 13,000 | 14,000 | 15,000 | 16,000 | 17,000 | 18,000 | 19 000 | 200,000 | 2000 | 22,000 | 000,22 | 23,000 | 24,000 | 25,000 | 26,000 | 7,000 | 78,000 | 29,000 | 30,000 | 31,000 | 32,000 | 33,000 | 34,000 | 35,000 | | | | | | |
| UTION | u | 0 | 0 | 14 | 0 | 6 | 0 | 223 | 9173 | 1.384 | 2 198 | 0,57 | 11.1 | 151 | 24 | 2 | 0 | 0 | 0 | C | 200 | 200 | 4/4 | 101 | 581 | 7,973 | 20,915 | 35,000 | 32, 140 | 152,977 | 9.841 | 27,732 | 6.672 | 1,566 | 186 | 197 | 63 | 7/ | | | 3 | - | - | | -> | 0 | 200 | 0 |
| PEAK DISTRIBUTION | Peak (psi) | | -12 000 | -11,000 | 10,000 | 000,01 | -0,000 | -8,000 | 000'/- | 000,9- | -2,000 | -4,000 | -3,000 | -2,000 | -1.000 | 0001 | 000 | 000,1 | 2,000 | 3,000 | 4,000 | 2,000 | 6.000 | 7.000 | 000 8 | 000,0 | 000,00 | 000,01 | 000,11 | 12,000 | 13,000 | 14,000 | 12,000 | 000,91 | 17,000 | 18,000 | 19,000 | 20,000 | 21,000 | 22,000 | 23.000 | 24,000 | 25,000 | 26,000 | 22,000 | 23,000 | 34,000 | 24,000 |

| | 10 10 10 10 10 10 10 10 | 10 10 10 10 10 10 10 10 | (ps1) | PEAK DISTRIBUTION | | RATGE DISTRIBUTION | UTION | R DIST | DISTRIBUTION |
|--|--|---|--|-------------------|-----|--------------------|---------|--------|--------------|
| 22 2.000 | \$\begin{array}{c c c c c c c c c c c c c c c c c c c | \$\begin{align*} \begin{align*} \begi | 22 2.00 | (ps1) | - | 1- | n. | cc | u |
| 1000 | 1,000 1,00 | 1,000 1,00 | 7 1,000 | 1 | | | | | |
| 1,000 | 1,000 | 1000 | 1,000 | | | | | | 293 |
| 1000 | 1000 | 1000 | 1000 | | 0 | | | , . | 169 |
| 1000 | 1000 | 1000 | 220 23000 24000 2500 27776 3,000 27776 3,000 27776 3,000 2,000 | | 7 | | | 7.1 | 519 |
| 23 3,000 (76,00) (-1, 9) (-1, 10) (-1, | 23 3,000 (76,00) (77,6 | 2 200 | 23 3,000 (76,00) (76,0 | | 0 | 000 | | 0.1 | 843 |
| 23 4,000 77,64 8 24 250 5,000 77,64 | 23 4,000 | 23 4,000 | 23 4,000 77,64 | - | 0 | 2,000 | (| 6 | 487 |
| 100 | 100 17, 154 1.00 1.00 | 100 | 250 3,423 6,700 2,777 2,700 3,423 7,000 3,772 1,000 3,772 1,000 3,773 1,000 3,774 1,000 3,774 1,000 3,774 1,000 1,242 1,000 1,242 1,000 1,242 1,000 1,242 1,000 1,242 1,000 1,242 1,000 1,242 1,000 1,00 | 1 | - | 3,000 | 100 001 | 8 | 103 |
| 100 | 3423 5,000 7,624 5 3423 7,000 3,044 3 4,000 3,044 3 5,000 7,624 3 6,000 7,624 3 1,000 7,624 | 3,423 3,000 2,624 3,425 3,000 2,624 3,425 3,425 3,425 3,425 3,22 | 100 | + | | 4,000 | 170,001 | 7 | 227 |
| 3 473 3 473 6,000 27,774 7,000 3,044 7,000 3,044 8,000 3,044 10,000 4,86 11,000 4,86 11,000 4,86 11,000 4,86 11,000 4,86 12,000 4,86 13,000 4,27 14,000 4,23 15,000 4,23 16,000 4,23 17,020 1,70 18,000 4,23 18,000 4,23 18,000 4,23 18,000 4,23 18,000 4,23 18,000 1,000 18,000 1,000 10,000 1,000 10,000 1,000 10,000 1,000 10,000 1,000 10,000 1,000 10,000 1,000 10,000 1,000 10,000 1,000 < | 3 47.3 3.46.6 6.000 27.774 6,964 8.000 3.044 6,964 8.000 3.044 7 10.000 3.044 10.000 3.044 10.000 4.6 11.000 4.6 12.00 13.000 4.6 13.000 4.7 14.000 4.7 15.000 4.7 15.000 4.7 15.000 4.6 15.000 3.5 16.000 4.6 17.000 1.000 18.000 3.5 18.000 18.000 <td>3 946 5.00 27.77 6,000 27.77 6,964 8,000 3,049 7,000 3,049 2,555 9,000 3,049 10,000 9,000 1,27 11,000 94 12,000 13,000 12,000 13,000 14,000 12,000 14,000 12,000 12,000 15,000 12,000 12,000 16,000 12,000 12,000 17,000 12,000 12,000 18,000 10,000 12,000 18,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000</td> <td>3 47.3 3 47.3 4,96.4 6,000 7,000 7,000 10,000 2,505 9,000 10,0</td> <td></td> <td></td> <td>5,000</td> <td>11,07</td> <td>9</td> <td>100</td> | 3 946 5.00 27.77 6,000 27.77 6,964 8,000 3,049 7,000 3,049 2,555 9,000 3,049 10,000 9,000 1,27 11,000 94 12,000 13,000 12,000 13,000 14,000 12,000 14,000 12,000 12,000 15,000 12,000 12,000 16,000 12,000 12,000 17,000 12,000 12,000 18,000 10,000 12,000 18,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000 12,000 10,000 10,000 | 3 47.3 3 47.3 4,96.4 6,000 7,000 7,000 10,000 2,505 9,000 10,0 | | | 5,000 | 11,07 | 9 | 100 |
| 3 423 7,000 7,654 7,000 7,654 7,000 7,674 7,000 7,00 | 3 423 7,000 7,656 7,000 7,00 | 3423 3424 5264 5264 5264 5265 | 3 423 7,000 7,654 7,000 7,654 7,000 7,004 7,00 | | 5 | 0000 | 27.776 | u u | 161 |
| 1000 3.046 1.3 1 | 1000 3/24/2 1/2 | 1000 3/346 1.3 1 | 1000 3/24/2 1.3 | 3, | 0 | 000 | 7,659 | ? . | 15 |
| 1000 1/242 1/2 1 | 2 1000 | 2 5.505 9,000 1/242 | 1000 1/242 1/2 1 | 9 | 9 | 000, | 3 048 | 4. | 28 |
| 9,000 | 9,000 | 9,000 | 9,000 | 2 | 6 | 8,000 | 1 242 | 7: | 6/7 |
| 10,000 | 10,000 | 10,000 | 10,000 | 1 | 1 | 000.6 | 220 | | 13 |
| 1,000 1,00 | 1,000 1,00 | 1,000 1,00 | 1,000 1,00 | | - | 10.000 | 9) 1 | 1 | 200 |
| 1,000 1,00 | 1,000 1,00 | 1,000 1,00 | 1,000 1,00 | | 2 | 11 000 | 7.0 | - | 14 |
| 1,000 1,00 | 1,000 2 | 1,000 26 1,000 26 1,000 1, | 1,000 256 1,000 | | G | 000 | 84 | | 611 |
| 13,000 16 17 17 17 17 17 17 17 | 1,000 1,00 | 13,000 16 17 17 17 17 17 17 17 | 13,000 16 17 18 18 18 18 18 18 18 | | 0 | 000.21 | 26 | " | 243 |
| 1,000 1,00 | 1,000 1,00 | 1,000 1,00 | 1,000 1,00 | | 0 | 13,000 | 9/ | 7: | 318 |
| 15,000 43 15,000 43 1702 15,000 43 1702 15,000 43 1703 17,000 43 1703 18,000 666 1704 18,000 666 1705 18,000 666 1705 18,000 19 1705 18,000 10 1705 18,000 10 1705 18,000 10 1705 18,000 10 1705 18,000 | 15,000 43 16,000 43 1702 16,000 626 18,000 626 18,000 626 18,000 626 18,000 626 18,000 626 18,000 626 18,000 626 18,000 626 18,000 626 18,000 626 18,000 626 18,000 626 18,000 626 18,000 626 18,000 7 18,000 7 18,000 7 18,000 7 18,000 7 18,000 | 15,000 43 16,000 43 17,02 16,000 42 17,000 17,000 17,000 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 18,000 646 19,000 19,000 19,000 19,000 19,000 . | 15,000 43 15,000 43 1702 16,000 42 1703 17,000 72 1704 17,000 72 1800 75 . | 0 | | 14,000 | 1 | F.: | 2000 |
| 1000 43 15 15 15 15 15 15 15 1 | 10 | 10 10 10 10 10 10 10 10 | 1000 43 15 15 15 15 15 15 15 1 | + | | 15.000 | - | 4. | |
| 1,20 | 1,20 1,200 | 120 1720 1730 1 | 1,20 | | 2 | 16 000 | 43 | 1 | 13,628 |
| Hyde 18,000 123 17 18 18 18 18 18 18 18 | Hyde 1/23 | Hyde 18,000 123 12 12 12 12 12 12 1 | Hyde 1/23 1/2 1/ | | 0 | 000.01 | 82 | | 55,312 |
| 1,000 1,00 | 1,000 6,00 | 18,000 656 18 18 18 18 18 18 18 1 | 1,000 1,00 | | 90 | 000,71 | 123 | · ' | 99,259 |
| 19,000 954 25,725 35,726 36,974 27,000 36,974 36,974 36,974 36,974 4,925 4,925 5,000 7,000 7,000 7,000 1,000 | 19,000 954 25,725 35,720 36,734 27,000 27,000 27,000 27,000 27,000 27,000 28,000 28,000 29,000 20,000 20,000 21,000 22,000 23,000 31,000 31,000 34,000 35,000 | 19,000 954 . | 19,000 954 35,726 20,000 1,000 35,726 20,000 1,000 496,726 22,000 30 496,726 23,000 30 496,726 23,000 30 50,000 7 7 6,000 7 7 7 29,000 7 1 29,000 0 1 31,000 0 1 31,000 0 25,000 34,000 0 1 31,000 0 25,000 35,000 0 1 31,000 0 2 31,000 0 31,000 35,000 32,000 35,000 33,000 35,000 34,000 35,000 35,000 | 3 | 3 | 18,000 | 666 | | 1/8/190 |
| 20,000 | 10,000 1,0 | 20,000 | 20,000 | + | · | 19,000 | 200 | 8. | |
| 1.00 | 1.00 | 1.00 | 1.00 | + | | 20.000 | | 6. | |
| 1,45,72 25,000 35,2 1,45,72 25,000 3 | 18 47 47 47 47 47 47 47 4 | 144,74 144,74 21,000 35,472 23,000 25,000 27,000 28,000 27,000 28,000 27,000 27,000 28,000 27,000 28,000 28,000 38,000 3 | 18 474 22,000 352 74 22,000 352 30 34 36 31 32 32 33 32 33 34 34 34 | - | 8 | 21 000 | 70111 | 101 | |
| 149,2 & S | 149,2 & \$2,000 39,472 24,000 39,472 24,000 1,000 | 149,2 & S. 1,000 33,472 24,000 35,472 25,000 1,000 2,000 1,000 2,000 1,000 2,000 1,000 2,000 | 149,2 & S | | 14 | 000 | 353 | 2 | |
| 23,972 24,000 8,927 7,000 250 7,000 250 7,000 8,000 8,000 1,000 8,000 1,00 | 23,972 24,000 28,927 25,000 1,092 25,000 25,000 27,000 28,000 29,000 17,000 17,000 18,000 19,000 | 23,772 24,000 28,927 25,000 7,092 7,000 25,000 7,092 7,000 8 31,000 8 31,000 7 33,000 7 34,000 7 34,000 7 35,000 7 35,000 | 23,972 24,000 8,927 7,000 25,000 7,000 2 8,000 7,000 8 30,000 1 33,000 0 34,000 35,000 35,000 35,000 37,000 8 30,000 1 33,000 1 34,000 1 35,000 1 3 | - | 60 | 000,22 | 30 | | |
| 24,000 1,052 1,052 25,000 250 27,000 27,000 28,000 8 31,000 2 32,000 31,000 31,000 32,000 33,000 34,000 35,000 | 24,000 1,052 1,052 1,052 25,000 1,052 27,000 27,000 2,000 8 31,000 0 34,000 0 35,000 35,000 35,000 | 8,927 1,052 1,052 2,000 2,000 2,000 1, | 24,000 1,052 1,052 25,000 250 271 28,000 16 30,000 8 31,000 2 30,000 33,000 34,000 35,000 | - | 72 | 23,000 | 336 | | |
| 25,000 1,6292 1,632 | 25,000 1,6292 1,6292 26,000 27,1 29,000 8 31,000 71 33,000 71 33,000 71 33,000 71 33,000 71 33,000 71 33,000 72 35,000 73 5,000 74 5,000 75 5,000 76 5,000 77 7,000 77 7,000 78 7,000 79 7,000 70 70 70 70 | 25,000 1,6292 1,6292 1,6392 | 25,000 1,052 1,052 2,000 28,000 1,000 | 1 | 21. | 24,000 | 57/ | | |
| 7, 252 7, 292 27, 000 28, 000 7, 29, 000 8 31, 000 8 31, 000 7 33, 000 9 34, 000 35, 000 | 7, 256, 000 250, 27, 000 27, 29, 000 17, 29, 000 18, 31, 000 19, 000 10, 000 | 7, 252 25.000 255 27, 000 2, 000 31,000 8 31,000 1 33,000 9 34,000 35,000 35,000 | 1,002 25,000 25 | + | 100 | 25,000 | | | |
| 7, 250 7, 000 7, 28,000 8, 31,000 8, 31,000 1, 33,000 1, 33, | 2,000 1, | 7, 000 7, 000 7, 000 7, 000 7, 000 8, 30,000 8, 30,000 7, 30,000 8, 30,000 9, 000 1, | 7, 000 7, 250 7, 000 7, 000 8 30,000 8 31,000 8 33,000 1 33,000 9 34,000 9 34,000 1 33,000 1 33,000 1 33,000 1 33,000 1 33,000 1 33,000 | + | , | 26.000 | 1 | | |
| 25c 28,000 | 25 28,000 17 29,000 18 31,000 1 33,000 1 33,000 1 34,000 1 35,000 | 28,000 17, 29,000 18,000 19 | 25c 28,000 171 29,000 18,000 19,000 | | 7, | 27 000:1 | 1 | | |
| 71 28,000 8 30,000 8 31,000 7 33,000 9 34,000 35,000 | 71 28,000 72 29,000 73 30,000 7 33,000 7 33,000 7 34,000 7 35,000 | 71 28,000 8 30,000 8 31,000 7 33,000 94,000 35,000 | 71 28,000 8 30,000 8 31,000 7 33,000 9 34,000 35,000 | - | 0 | 000 | , | | |
| <u>∞</u> ∞ ≈ ~ 0 | <u>@</u> & ~ ~ 0 | ã ∞ N − C | © ∞ ⋈ − C | | 11 | 000,82 | 0 | | |
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| ∞ ~ ~ O | ∞ N ~ C | p N - 0 | ∞ ~ ~ ° | - | | 30,000 | | | |
| N - 0 | N-0 | N - C | N - 0 | | | 31 000 | | | |
| -0 | -0 | -0 | -0 | | 2 | 000 | | | |
| 0 | 0 | 0 | 0 | | | 32,000 | | | |
| 5 | | | | | | 33,000 | | | |
| | | | | 1 | T | 34,000 | | | |
| | | | | | - | 200 | | | |
| 5,000 (4,000 27,000 | 5,000 2,000 27,000 | 5,000 (4,000 27,000 | 5,000 4,000 27,000 | 4,000 | | 000,00 | | | |
| 17,000 | 2,000 | 17,000 | 17,000 | 2,000 | Ī | | | | |
| 000,72 | 7,000 | | 7,000 | 6,000 | T | | | | |
| | | | | 12,000 | | | | | |
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TABLE B-111 SPECTRUM BS6.COMB8 (NO. 111)

TABLE B-112 SPECTRUM BS6.COMB9 (NO. 112)

DESCRIPTION: SPECTRUM NO. 89 WITH RANGE TRUNCATION = 3,500 PSI.

| FLIGHT HOURS | 2,500 | FLIGHTS - 2,422 | - LANDINGS | 3,843 |
|--------------------------|---------|----------------------------|------------------------|---------|
| TOTAL CYCLES | 181,856 | AVERAGE NO. OF CYCLES PER: | FLIGHT | 75.1 |
| RANGE TRUNCATION (PSI) - | - 3,500 | | FLIGHT HOUR = | 72.7 |
| HIGHEST PEAK (PSI) | 27,750 | SMALLE | MALLEST VALLEY (PSI) = | -24.298 |

| 12,000 | | | | | | |
|--|--------|---------|----------|--------|------|---------|
| 223 3,000 1. | 1 | - | 1 1 | C. | R | c |
| 7 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 | | | | | | |
| 1,000 1,00 | 19 600 | 0 | | | 21- | 293 |
| 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2 | 2000 | 47 | | | | 169 |
| 1000 | 000 | 0 | | | 7.1- | 6/5 |
| 222 3,000 | 0000 | 6 | 000. | | 0.1 | 683 |
| 1.00 | -9,000 | 1 | 2,000 | - | 6 | 407 |
| 138 | -8,000 | 3 | 3,000 | 300 | 8 | 10/ |
| 1384 5,000 6,5/39 -2,5 | -7.000 | 577 | 4.000 | 257'61 | - 1 | 109 |
| 1,384 5,000 2,4,74 1,584 1,000 1,584 1,594 1,000 1,584 1,594 1,000 1,584 1,594 1,5 | 000 | 943 | 000 | 75,565 | | 337 |
| 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, | 0000 | 1.384 | 000.5 | 68.139 | 0. | 161 |
| 134 8,000 1,023 1,023 1,023 1,023 1,023 1,023 1,023 1,023 1,023 1,023 1,023 1,023 1,023 1,023 1,023 1,023 1,03 | 000.6- | 2008 | 000,0 | 1000 | 5 | 10 |
| 1,177 8,000 2,269 7,2 7,2 7,000 | -4.000 | 200 | 7.000 | 100/47 | 4 | 1 |
| 134 9,000 2,263 1,000 2,000 | 2 000 | 1,117 | 000 | 7,584 | - 3 | 20 |
| 1,000 1,033 1,1 | 000 | 739 | 200 | 2,283 | | 64 |
| 10,000 265 0 | 000.3- | 24 | 000.6 | 1.033 | 7 | 89 |
| 1000 240 1000 240 1000 240 1000 240 1000 240 1000 240 | 000.1- | | 10,000 | 376 | - | 90 |
| 1,000 1,00 | 0 | , | 11,000 | 202 | 0 | 70 |
| 1,000 1,00 | 000 | 0 | 12 000 | 96 | | 121 |
| 3,000 33 35 35 35 35 35 35 | 000 | 0 | 000,31 | 7.8 | - | 243 |
| 14,000 23 364 15,000 77 364 15,000 77 364 15,000 77 364 15,000 77 364 15,000 77 364 15,000 77 364 15,000 77 364 15,000 77 364 15,000 77 364 15,000 77 364 15,000 77 364 16,000 77 364 16,000 77 364 16,000 77 364 16,000 77 364 16,000 77 364 16,000 77 37 37 37 37 37 37 | 2,000 | - | 13,000 | 33 | .2 | 000 |
| 1,000 1,00 | 2 000 | 0 | 14 000 | 50 | 2 | 129 |
| 15,000 | 2000 | 0 | 000 | 24 | : | 3.134 |
| 16,000 77 79 79 79 79 79 79 | 4,000 | 280 | 000,61 | 707 | 4. | 15 730 |
| 17,000 77 18,000 77 18,000 77 18,000 77 18,000 77 18,000 77 18,000 77 18,000 77 18,000 77 18,000 77 18,000 78,00 | 5.000 | 201 | 16.000 | 200 | 5 | 00/10/ |
| 151 152 177 179 174 | 6.000 | 414 | 17 000 | 12 | , | 55,302 |
| 18,000 | 000 | 151 | 000,71 | 77 | 0.1 | 69,227 |
| 19,000 | 300 | 581 | 18,000 | 123 | - | 118 198 |
| 25, 715 35, 600 35, 600 13, 600 15, 600 16, 700 16, 700 17, 700 18, | 8,000 | 7.071 | 19,000 | 1111 | 8. | |
| 25,000 35,000 35,000 35,000 153,000 | 000 | 1 | 20.000 | 141 | 0 | |
| 35,000 132,141 23,000 153,141 23,000 24,000 24,000 24,000 24,000 24,000 25,000 26,000 26,000 27,000 27,000 27,000 27,000 28,000 29,000 20,0 | 000 | 511.02 | 2000 | 26/ | | 0 |
| 32,141 22,000 34/0 153,004 153,004 163,004 | 0000 | 35.000 | 000.12 | 1.03.8 | 0 | ALC DI |
| 153,000 27,717 28,000 27,713 28,000 27,000 27,000 27,000 27,000 27,000 28,000 28,000 29,000 20,00 | 1,000 | | 22,000 | 9170 | | 2/2/2 |
| 193,014 24,000 21,493 25,000 21,493 25,000 21,493 25,000 21,493 21,000 21,493 21,000 21,493 21,000 21,493 21,000 21,493 21,000 21,493 21,000 21,493 21,000 21,493 21,000 21,493 21,400 21,493 21,400 21,493 | 12 000 | 34,141 | 23 (100) | 244 | | |
| 27,000 27,932 2,000 3,000 1,544 28,000 1,544 28,000 1,944 1,000 | 2000 | 153,0/6 | 000 | 463 | | |
| 27,932 2,000 1,542 1,544 2,000 1,944 1,944 1,000 1,000 1 | 0000 | 1,841 | 000,42 | 70/ | | |
| 25,000 1,544 28,000 1,544 28,000 1,747 1,744 28,000 1,747 1,744 | 14,000 | 27912 | 25,000 | 337 | | |
| 1, 544 1, 544 1, 544 27,000 1, 97 1, 97 1, 97 1, 97 1, 97 1, 97 1, 97 1, 900 1, 97 1, 97 1, 900 1, 900 | 15.000 | - | 26,000 | 200 | | |
| 1, 544 1, 544 28,000 1, 97 1, 000 1, 1, 000 1, 1, 000 1, 1, 000 1, 1, 000 1, | 16 000 | 6,672 | 27 (00) | 20 | | |
| 28,000 1,97 1,97 1,97 1,97 1,97 1,900 | 000,01 | 1,566 | 2000 | 153 | | |
| 797 797 797 797 797 797 797 797 | 000,7 | 184 | 78,000 | 76 | | |
| 000000000000000000000000000000000000000 | 000.8 | 10 | 29.000 | | | |
| 0 | 10 000 | 141 | 30 000 | | | |
| 200000000000000000000000000000000000000 | 0000 | 63 | 000 | , | | |
| 2-0000080 | 00000 | 7/ | 31,000 | 0 | | |
| 000000000000000000000000000000000000000 | 2,000 | - | 32.000 | 0 | | |
| 000000000000000000000000000000000000000 | 22 000 | - | 32 000 | - | | |
| 0 0 0 0 0 0 | 000,22 | 0 | 33,000 | | | |
| 2000 | 23,000 | 0 | 34,000 | | | |
| 00000 | 000 76 | | 35 (10) | | | |
| | 000 | 0 | 2001 | | | |
| | 000,62 | 0 | | | | |
| | 26,000 | - | | - | | |
| + | 27,000 | | | | | |
| | 28 000 | 200 | | | | |
| | | 0 | | | | |

| PEAK DISTRIBUTION RANGE DISTRIBUTION R DISTRIBUTION RANGE DISTRIBUTION R DISTRIBU | KANGE TRUNCATION (PSI) HIGHEST PEAK (PSI) | | | | SMALLEST VALLEY (PSI) | и и | 72.7 -27.943 |
|--|--|----------|---------|--------|-----------------------|----------|-----------------|
| (1951) | | BUTION | | BUTION | | RIBUTION | |
| 1000 | | u | 1 | u | W. | c | |
| 1000 | - 14,000 | 0 | | | | | |
| 1,000 | -12,000 | 2 | | | -1.5 | 867 | |
| 1,000 25,492 2,000 2,0 | 000,11- | 7 | 000 | | -1.2 | 529 | |
| 1499 3,000 25,402 3,000 3,00 | 000,01- | 2 | 000,000 | | 0.1- | 869 | _ |
| 10 | -8,000 | 661 | 3,000 | | 000 | 064 | |
| 3771 5,000 76,792 76,794 76,7 | -7,000 | 305 | 4,000 | 0 | 7- | 459 | |
| 1,000 1,07,179 1,000 1,07,179 1,000 1,07,179 1,000 1,07,179 1,000 1,07,179 1,000 1,07,179 1,000 1,07,179 1,000 1,07,179 1,000 1,07,179 1,000 1,000 1,000 1 | -6,000 | 3771 | 5,000 | 32,406 | 9 | 323 | _ |
| 1,000 24,360 4 | -5,000 | 4.995 | 000,9 | 6/1.0/ | 5 | 92 | _ |
| 10 0 0 0 0 0 0 0 0 0 | 2,000 | 3.098 | 7,000 | 24.380 | 4 | 88 | |
| 1,000 | -3,000 | 37/ | 8,000 | 846'9 | | 67 | _ |
| 1,000 1,357 1,000 1,357 1,000 1,36 1,000 1,36 1,000 1,36 1,000 1,36 1,000 1,36 1,000 1,36 1,000 1,000 1,000 1, | 000,2- | 20 | 000,60 | 2.817 | 7 | 63 | |
| 1,000 365 1 1,000 1, | 000.1- | , | 000,01 | 1,357 | - | 96 | |
| 1,000 138 13 14 15 15 15 15 15 15 15 | 000 | 0 | 12,000 | 385 | 0 - | 151 | |
| 1,000 1,38 1,5 1 | 000 | • | 12,000 | 75 | | 243 | |
| 1,000 15,000 15,000 15,000 15,000 15,000 15,000 15,000 15,000 177 178 18,000 177 178 18,000 178 18,000 178 18,000 178 18,000 178 18,000 178 18,000 178 18,000 18,00 | 2,000 | | 13,000 | /38 | 7. | 795 | |
| 1,000 1,00 | 4 000 | → | 15,000 | 75 | ? < | 3,230 | |
| 100 | 2,000 | 0 | 16,000 | 95 | | 14,183 | |
| 136 194 196 194 196 194 196 194 196 194 196 | 6.000 | 909 | 17,000 | 22 | 2 4 | 52,815 | _ |
| 10 | 7.000 | /36 | 18,000 | 77 | - | 89,706 | |
| 1,000 1,00 | 8.000 | 7 | 19.000 | " | . « | 844 | |
| 1,000 51 1.0 | 000,6 | 3 529 | 20,000 | 07 | 6. | 0 | |
| 22,000 1/7 1/7 28,000 1/7 1/7 28,000 2.7 25,000 1/2 25,000 1/2 25,000 1/2 25 25 25 25,000 1/2 25 25 25 25 25 25,000 1/2 25 25 25 25 25 25 25 25 25 25 25 25 25 | 10,000 | 10011 | 21,000 | | 1.0 | 13 000 | |
| 23,000 23,7240 25,720 25,720 25,703 26,000 26,00 | 11,000 | 8.709 | 22,000 | 7// | | 12,77 | |
| 25,703 25,703 25,703 26,704 26,707 26,000 26,707 26,000 26,707 26,000 28,000 28,000 28,000 28,000 38,000 7,000 1,400 1,400 1,400 20,000 1,400 1,400 1,400 20,000 20,000 1,400 1,400 1,400 20,000 | 12,000 | 33,240 | 23,000 | 424 | | | |
| 25,700 26,701 26,717 26,717 26,717 28,000 28,000 28,000 28,000 38,000 38,000 38,000 7,300 7,300 1,300 2,300 3,000 1,300 2,300 3,000 3,000 1,300 2,300 3,00 | 13,000 | 31.527 | 24,000 | 787 | | | |
| 26,267 26,777 27,000 28,000 (33) 30,000 (34) 284 31,000 284 32,000 19 31,000 53 34,000 19 35,000 19 36,000 20 20 20 20 20 20 20 20 20 | 14,000 | 25,703 | 25,000 | 1.043 | | | |
| 26,777 28,000 (4,505 (4 | 000.61 | 8,267 | 26,000 | 764 | | | |
| 200 | 000,91 | 26, 171 | 000,72 | 258 | | | |
| 26 3 3,000 | 000,01 | 6,656 | 000,000 | 53 | | | |
| 7905 7900 | 000 | 633 | 30,000 | 364 | | | |
| 284 31,000 38 33,000 58 33,000 14 35,000 0 31,000 0 32,000 | 20.00 | 1,305 | 30,000 | 22 | | | |
| 38 33,000 28 55 33,000 28 74,000 34,000 6 75,000 6 76,000 6 76,000 6 76,000 6 76,000 6 76,000 6 76,000 6 76,000 6 | 21 000 | 284 | 32 000 | 162 | | | |
| 55 34,000 14 35,000 0 0 35,000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 22 000 | 38 | 33,000 | 0 | | | |
| 35,000 | 23.000 | 55 | 34 000 | 21 | | | |
| 3 34,000 | 24 000 | * | 35,000 | 5 | | | |
| 0 0 000 | 25.000 | 3 | 36,000 | - | | | |
| + | 26.000 | 0 | | 0 | | | |
| 1 | 27.000 | 0 | | | | | |
| | 28 000 | 200 | | | | | |
| The same name of the same of t | | | | | | | |

TABLE B-113 SPECTRUM BS6.COMB10 (NO. 113)

DESCRIPTION: SPECTRUM NO. 103 WITH FLIGHT I.0g STRESSES = 0, AND THEN. STRESSES INCREASED 100 PERCENT.
 FLIGHTS = 2.422
 LANDINGS = 3.843

 AVERAGE NO. OF CYCLES PER: FLIGHT = 75.1

 FLIGHT HOUR = 72.7
 DESCRIPTION: SPECTRUM NO. 6 WITH 26 PERCENT LOWER STRESSES AND THE 10 HIGHEST PEAKS = 27,750 PSI AND THEIR NUMBER INCREASED TO 200. FLIGHT HOURS - 2.500
TOTAL CYCLES - 181.856
RANGE TRUNCATION (PSI) - 4.000 (0.74)

TABLE B-114 SPECTRUM BS6.COMB11 (NO. 114)

| _ | • |
|-------------------------|---|
| 186,71- | 1 |
| SMALLEST VALLEY (PSI) = | |
| - 27.750 | |
| HIGHEST PEAK (PSI) | |

| TOTAL CYCLES | | 161.813 | AVER | AVERAGE NO OF CYCLES PER | VCI ES PER | FLIGHT | FI IGHT |
|------------------------|-----------|--------------------|--------|--------------------------|------------|-----------------------|-----------|
| RANGE TRUNCATION (PSI) | = (ISA) N | 4,000 (2) | | | | FLIGHT HOUR | HOUR = |
| HIGHEST PEAK (PSI) | • | 23,419 | | | SMALLES | SMALLEST VALLEY (PSI) | = (ISA) × |
| PEAK DISTRIBUTION | SUTION | PANGE DISTRIBUTION | STRIBL | TION | ~ | DISTRIBUTION | SUTION |
| Peak (psi) | c | Range (psi | 1) | c | cc | - | C |
| | | | 1 | | | + | 59 630 |
| -12,000 | | _ | 1 | | 5.7 | - | 5.012 |
| 000 | | | | | 7-1- | - | 20,684 |
| 000.01- | | 000 | | | 2.0 | | 742 |
| 000.6 | | 000, | | | , | - | 52 |
| 000 | | 2000 | | | 0.1 | | 5,367 |
| 000. | | 000, | | | /:- | - | 44,870 |
| 000 | | 000 | | | 0.1 | - | 1,582 |
| 000.5 | | 000 | - | | C:- | | 15,770 |
| 000 | | 200,0 | | 0 | 4. | | 7,052 |
| 2000 | | | | 54,419 | | - | 1,407 |
| 000.2- | 0 | 000 | - | 14,629 | 2 | - | 43 |
| 000. | 7 | 000 | | 57,670 | • | | 595 |
| 000 | 0 | 200. | | 2,090 | | | 0 |
| 000 | 0 | 2000 | | HLH 61 | | - | * |
| 2,000 | 2,821 | 2000 | | 737 | 7. | | |
| | | | | | | | |

2,778 2,713 741 821 59

270

222,000 222,000 222,000 222,000 223,00

2, 26, 27 2, 33, 25, 34 2, 34, 35, 35 2, 34, 35 2, 3

22,000 21,000 22,000 23,000 24,000 25,000 25,000 27,000

| -11,000 -10 | 2 |
|--|-------|
| 1,000 1,277 1,000 1,277 1,000 1,277 1,000 1,277 1,000 1,279 1,000 1,00 | 2 |
| 1,000 1,317 1,000 1,31 | |
| 1,000 1,00 | 5.7 |
| 1,000 1,00 | 2.1- |
| 2,000 2,000 2,000 3,000 1,534 1,540 1,000 1, | -1.0 |
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| 1,000 1,00 | |
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| 4,348 8,000 4 | 4 - |
| 1,533 9,000 1,00 | 3 |
| 341 1000 1 | 2: |
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| 1,000 12,000 13,000 14,000 13,000 13,000 14,000 14,000 15,000 17,000 17,000 17,000 17,000 17,000 18 | |
| 12,000 13,000 14,000 14,000 15,000 16,000 17,000 1 | 0 |
| 742 742 13,000 14,000 13,400 13,400 13,400 13,400 13,447 17,000 17,000 17,000 18,000 18,000 18,000 18,000 18,000 18,000 18,000 18,000 18,000 18,000 19,0 | |
| 1,000 1,00 | |
| 14,000 15,000 17,000 1 | 7. |
| 15,000 247 17,000 13,447 17,000 18,247 17,000 18,264 18,000 18,267 18,267 18,2 | 3,212 |
| 16,000 1/1,000 1/1,000 1/1,000 1/1,000 1/1,000 1/1,000 1/2,556 1/2,000 1/2,576 1/2,000 1/2,576 1/2,000 1/2,576 1/2,000 1/2,576 1/2,000 | |
| 17,000 13,447 18,000 18,576 38,574 20,000 13,576 13,000 14,570 15,000 16,664 17,000 18,000 18,000 19,000 | 5.5 |
| 13.447 141.546 18.000 18.00 | - |
| 19,000 18,574 19,000 12,074 1,576 | |
| 32, 746 32, 747 32, 707 4, 570 1, 100 1, 570 1, 570 1, 570 1, 570 1, 570 1, 570 1, 570 1, 100 1, 570 1, 100 1, | - |
| 38,654 22,000 4,664 23,000 1,570 24,000 27,000 27,000 27,000 27,000 28,000 31,000 31,000 31,000 32,000 33,000 34,000 35,000 35,000 36,000 37,000 | 000 |
| 22,000 4,570 23,000 24,000 66 66 73 73 73 73 74 75 75 76 76 76 76 76 76 76 76 76 76 | 6. |
| 22,000 1,570 1,570 24,000 24,000 25,000 25,000 26,000 26,000 31,000 31,000 31,000 31,000 32,000 33,000 34,000 35,000 37,000 | 1.0 |
| 23,000 3/2 25,000 6/8 26,000 73 27,000 28,000 29,000 30,000 31,000 31,000 33,000 34,000 35,000 | |
| 1,370 1,372 1,372 1,300 1,300 1,000 1, | |
| 375 13 18 19 19 19 19 | |
| 99 89 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | |
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TABLE B-115 SPECTRUM BS6.COMB12 (NO. 115)

TABLE B-116 SPECTRUM BS6.COMB13 (NO. 116)

DESCRIPTION: SPECTRUM NO. 114 WITH 35 PERCENT HIGHER STRESSES

FLIGHTS = 2,422 LANDINGS = 3,843

AVERAGE NO. OF CYCLES PER: FLIGHT = 66.8

FLIGHT HOUR = 64.7

SMALLEST VALLEY (PSI) = -31,617

FLIGHT HOURS = 2,500

TOTAL CYCLES = 161,813

RANGE TRUNCATION (PSI) = 4,000 (2,7)

HIGHEST PEAK (PSI) = 31,616

3.843 128.6 124.5 . . .

DESCRIPTION: SPECTRUM NO. 80 WITH RANGE TRUNCATION = 3,500 PSI.

| FLIGHT HOURS | | 2,500 | FLIGHTS = 2.422 | LANDINGS | • |
|------------------------|---|---------|-----------------------------------|-----------------------|---|
| TOTAL CYCLES - 311,357 | | 311,357 | AVERAGE NO. OF CYCLES PER: FLIGHT | FLIGHT | • |
| RANGE TRUNCATION (PSI) | | 3,500 | | FLIGHT HOUR : | ~ |
| LINGS OF AC AN IDEA | , | 11 701 | SMALLES. | CMALLECT VALLEY (PCI) | - |

| -24.298 | | | _ | | | | | | |
|---------------------------------|--------------------|-------------|---------|-------|-------|------|-------|---------|--------|
| - EY (PSI) = | IBUTION | u | 243 | 169 | 519 | 863 | 481 | 109 | 337 |
| SMALLEST VALLEY (PSI) = -24.298 | R DISTRIBUTION | ĸ | 217 | | 7.1 | 0.0 | | 0. | |
| | UTION | u | - | | | | 0 | 131,244 | 75.576 |
| 23.293 | RANGE DISTRIBUTION | Range (psi) | | | 1 000 | 000. | 2,000 | 2000 | 000 |
| | UTIOL | c | 0 | 47 | 0 | 6 | 0 | 223 | 943 |
| HIGHEST PEAK (PSI) | PEAK DISTRIBUTION | Peak (psi) | -12 000 | 1,000 | 2000 | 000 | 000 8 | 2,000 | 000 |

| DISTRIBUTION | u | 01765 | 2000 | 30,0 | 20,684 | 742 | 52 | 1 | 2,367 | 44,870 | 1, 582 | 15.770 | 4.000 | 1004 | 1,407 | 43 | 595 | | | | | | | | - | 1 | - | > | 0 | 7 | | | | | | | | | | | | | | | | | | | | | |
|-------------------|-------------|-------|---------|---------|---------|------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| R DIST | R | | -1.5 | -1.2 | 10 | | 6 | 8 | 7- | 9 | 2 4 | | 4 | 3 | - 2 | | - | 0 | - | 2 | | ? . | 4. | 5: | 9. | 7. | 8 | 0 | | 0 | | | | | | | | | | | | | | | | | | | | | |
| UTION | u | | | - | | | | - | | | | | | - | | 0 | 1.184 | 757 75 | 3 / 60 | 29976 | 61,618 | 2.844 | 2.003 | 8 640 | 2000 | 11,356 | 144 | 2.644 | 2,787 | 66 | 700 | 011 | 937 | 101 | 100 | - | 107 | h | 12 | 21 | 37 | - | | | 0 | 01 | 0 | | | | |
| RAGE DISTRIBUTION | Range (psi) | 1 | 1 | | 1 000 | 2000 | 000.7 | 3,000 | 4.000 | 2 000 | 000 | 000.0 | 000. | 8,000 | 000 | 000 01 | 000,01 | 000 | 12,000 | 13.000 | 1,000 1 | 000 | 000,61 | 16,000 | 17,000 | 18,000 | 19.000 | 20.000 | 21 000 | 000,12 | 000,22 | 23,000 | 24,000 | 25,000 | 26.000 | 27.000 | 28 000 | 0000 | 000.67 | 30,000 | 31,000 | 32,000 | 33,000 | 34.000 | 35,000 | 2000 | CONT. | | | - | |
| UT101 | c | | | | | | | I | | | | | | | | | | | | - | 0 | 2,821 | 31.867 | 34 5/9 | 21,017 | 1000 | 5827 | 36,206 | 8,243 | 2,237 | 1,620 | 6.950 | 701 | 403 | | 1,435 | 99 | * | 267 | 181 | 44 | 20 | 200 | 2 | | 7/ | , | 40 | - | | |
| PEAK DISTRIBUTION | Peak (psi) | T | -12,000 | -11,000 | -10.000 | 000 | 000.6 | -8,000 | -7.000 | -6.000 | 6,000 | 000.5- | -4,000 | -3,000 | -2.000 | 1 000 | 0001- | 0 | 000 | 2.000 | 3 000 | 2000 | 000,4 | 000,6 | 000,9 | 7,000 | 8,000 | 000.6 | 1000 | 000,01 | 000,11 | 12,000 | 13,000 | 14,000 | 15.000 | 16.000 | 17 000 | 2000 | 000,81 | 000,61 | 20,000 | 21,000 | 22,000 | 23,000 | 24.000 | 25,000 | 27,000 | 200,02 | 21,000 | Con ac | 200,00 |

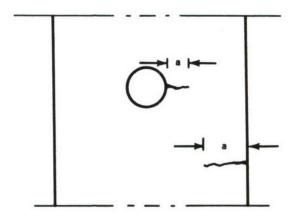
| DISTRIBUTION | c | | 293 | 169 | 517 | 2/0 | 86.3 | 481 | 109 | 23.7 | 100 | 161 | 16 | 58 | 6/7 | 27 | 90 | 90 | /37 | 243 | 8/5 | 3.057 | 76751 | 55.35 | 20,000 | 1,000 | 10,'01 | 0 | 0 | 14,218 | | | | | | | | | | | | | | | | | | | |
|-------------------------|-------------|---|-----|-------|---------|---------|-------|------|---------|--------|--------|--------|--------|-------|--------|-------|--------|--------|--------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|
| K DISIR | æ | | | 0.0 | 7.1- | 0:7 | - 6 | | 0. | | 9:- | 2 | | 1. | 5 | 2 | 7 | 0 | | . " | 7. | .3 | 4. | .5 | 9. | 7. | 8. | 6 | 100 | 2. | | | | | | | | | | | | | | | | | | | |
| | u | | | | | | | 0 | 131.244 | 10000 | 12,3/6 | 65,166 | 24,006 | 7.583 | 2 7.82 | 1041 | 200 | 097 | 103 | 88 | 14 | 22 | 100 | " | 30 | 2 00 | 0 | 113 | 226 | 1,036 | 94c | 463 | 90/ | 336 | 2 | /53 | 24 | 7 | - | 0 | | | | | | | | | |
| Water of State of Total | Range (psi) | | | | | 1,000 | 2.000 | 2000 | 2,000 | 4,000 | 5,000 | 000 | 2000 | 000,0 | 8,000 | 000.6 | 10,000 | 11,000 | 12 000 | 2000 | 13,000 | 14,000 | 15,000 | 16,000 | 17,000 | 18,000 | 19,000 | 20.000 | 21.000 | 22,000 | 22,000 | 000,62 | 000,42 | 000,62 | 000.92 | 000,12 | 28,000 | 29,000 | 30,000 | 31,000 | 32,000 | 33,000 | 34.000 | 35 000 | 200.00 | | | | - |
| | c | | 0 | 47 | 0 | 0 | - | 0 | 223 | 2110 | - | 1,384 | 3,098 | 7.719 | 739 | 24 | - | 2 | 0 | 0 | 0 | 0 | 384 | 717 | 161 | 100 | 1000 | 1,713 | 20,713 | 35,000 | 32,143 | 152,990 | 4.844 | 27,931 | 6,678 | 1,566 | 186 | 197 | 63 | 1 | 1 | | | 2 | 0 | | | I | |
| FEAR DISTRIBUTION | Peak (psi) | I | 200 | 2,000 | C00'11- | -10.000 | -000 | 000 | 0000 | 000'/- | -6.000 | 5 000 | 000 | 200 | -3,000 | 2,000 | 000'- | 10 | 000 | 000 | 2000 | 3,000 | 4,000 | 2,000 | 000.9 | 7,000 | 8,000 | 000.6 | 000 | 000 | 2000 | 12,000 | 2000 | 000 | 000 | 000.01 | 000'/ | 000.81 | 19,000 | 20000 | 21,000 | 22,000 | 23.000 | 24 000 | 2000 | 000.65 | 26,000 | 27,000 | 1 |

APPENDIX C EXPERIMENTAL DATA

This appendix contains the experimental data generated in this program. All data pertain to 7475-T7651 aluminum alloy bare plate, t=0.25 in. The data are summarized in the following tables:

| Table | Data |
|-------------------|--|
| C-1 | Chemical Analysis and Tensile Static Strength |
| C-2, C-3 | Constant Amplitude Loading Crack Growth Data |
| C-4 through C-9 | Baseline Spectra Crack Growth Data |
| C-10 through C-35 | Spectra Variation Crack Growth Data |
| C-36 | Sustained Compression Loading Effect Crack Growth Data |

In all crack growth data, unless otherwise noted, the crack length 'a' was measured from the edge of the hole, or the edge of the specimen, on one side of the specimen:



Any reference to 'depth' pertains to through-the-thickness crack length. In spectrum loading tests the initial crack length is due to precracking at $S_{max} = 12,000$ psi, R = 0.02.

The loading frequency in constant amplitude loading tests ranged between 3 and 6 Hz. The spectrum loading tests were run at 4 Hz.

TABLE C-1
7475-T7651 ALUMINUM ALLOY PLATE (t = 0.25 IN., BARE)
CHEMICAL ANALYSIS AND TENSILE STATIC STRENGTH TEST RESULTS

CHEMICAL ANALYSIS:

| | ANALYSIS | STANDARD |
|----|----------|-------------|
| MG | 2.0 | 1.9 – 2.6 |
| CR | 0.24 | 0.18 - 0.25 |
| ZN | 5.2 | 5.2 - 6.2 |
| CU | 1.4 | 1.2 - 1.9 |
| TI | 0.01 | 0.06 MAX |
| FL | 0.12 | 0.12 MAX |
| SI | 0.10 | 0.10 MAX |
| MN | 0.01 | 0.06 MAX |

TENSILE STATIC STRENGTH:

| SPECIMEN ⁽¹⁾ | YIELD (PSI) | ULTIMATE (PSI) | ELONGATION (%) |
|-------------------------|----------------|-------------------|-------------------|
| 1A | 67,946 | 76,332 | 14.3 |
| 1B | 66,004 | 75,919 | 14.0 |
| 1C | 65,771 | 75,077 | 14.1 |
| AVE | 66,574 | 75,776 | 14.13 |

(1) W = 0.5 IN., 2.0-IN. GAGE LENGTH

TABLE C-2 CONSTANT AMPLITUDE LOADING da/dN TEST CRACK GROWTH DATA

| | s | | | | ENGTH (IN.) E(1) A OR B |
|----------------------|---------------------------|------------|--|---|---|
| SPECIMEN | S _{MAX} (PSI) | R | CYCLES | (a _A) _i | (a _B) _i ⁽²⁾ |
| B1 (W = 11.5 IN.) | 6,468 ↓ 6,468 | 0.4 0.4 | 0 500,000 650,000 | 0.032 ⁽³⁾ 0.032 0.054 | 0.025 ⁽³⁾ 0.025 0.025 |
| | 8,620 8,620 | 0.6 | 0 60,000 120,000 180,000 240,000 300,000 360,000 420,000 480,000 | 0.054 0.061 0.068 0.075 0.085 0.092 0.100 0.107 0.115 | 0.025 0.025 0.025 0.033 0.036 0.037 0.039 0.041 0.041 |
| | 6,468 | 0.4 | 0 60,000 120,000 180,000 240,000 320,000 | 0.115 0.128 0.133 0.141 0.151 0.165 | 0.041 0.041 0.042 0.046 0.049 0.054 |
| | 11,905 | 0.6 | 0 20,000 60,000 120,000 160,000 | 0.165 0.176 0.195 0.235 0.266 | 0.054 0.057 0.065 0.078 0.088 |
| F2 (W = 11.0 IN.) | 11,100 ↓ 11,100 | 0.4 | 0 16,100 26,430 | 0.193 ⁽⁴⁾ 0.210 0.243 | 0.262 ⁽⁴⁾ 0.279 0.342 |
| | 11,100 | 0.8 | 0 124,000 174,000 274,000 374,000 474,000 574,000 684,000 | 0.243 0.247 0.260 0.269 0.281 0.292 0.301 0.313 | 0.342 0.359 0.370 0.381 0.389 0.409 0.423 0.437 |
| | 11,100 | 0.8 | 744,000 | 0.320 | 0.443 |

^{(1) 1/4-}IN. DIAMETER
(2) FASTENER IN HOLE: NET FIT (0.0001 → 0.0002 IN. CLEARANCE) TITANIUM HILOK, NO HEAD NOR NUT
(3) DUE TO PRECRACKING AT S_{MAX} = 12,000 PSI, R = 0.02

⁽⁴⁾ DUE TO SPECTRUM F LOADING, SEE TABLE 4-1, LARGEST PEAK IN LAST FLIGHT = 16,138 PSI

TABLE C-2 (CONT) CONSTANT AMPLITUDE LOADING da/dN TEST CRACK GROWTH DATA

| | | R | CYCLES | CRACK LENGTH (IN.) AT HOLE ⁽¹⁾ A OR B | | |
|----------------------|---------------------------|--------------------|---|---|---|--|
| SPECIMEN | S _{MAX} (PSI) | | | (a _A) _i | (a _B) _i (2) | |
| F3 (W = 11.0 IN.) | 5,220 5,220 | -1.5 -1.5 | 0 126,500 | 0.216 ⁽³⁾ 0.216 | 0.272 ⁽³⁾ 0.272 | |
| | 10,000 | -1.5 -1.5 | 0 23,500 27,500 31,500 35,200 | 0.216 0.335 0.354 0.381 0.415 | 0.272 0.427 0.461 0.507 0.552 | |
| | 7,620 , 7,620 | -1.5 -1.5 | 0 8,300 18,300 29,300 35,300 | 0.415 0.447 0.491 0.538 0.566 | 0.552 0.599 0.664 0.740 0.787 | |
| | 5,220 | -1.5 | 0 13,000 23,000 33,000 43,000 | 0.566 0.585 0.598 0.613 0.624 | 0.787 0.822 0.849 0.878 0.902 | |
| | 5,220 | -1.5 | 53,000 | 0.639 | 0.927 | |

^{(1) 1/4-}IN. DIAMETER (2) PASTENER IN HOLE: NET FIT (0.0001 ightarrow 0.0002 IN. CLEARANCE) TITANIUM HILOK, NO HEAD NOR NUT

⁽³⁾ DUE TO SPECTRUM F LOADING, SEE TABLE 4-1, LARGEST PEAK IN LAST FLIGHT = 16,138 PSI

TABLE C-3 CONSTANT AMPLITUDE LOADING CRACK GROWTH DATA FROM PRECRACKING TESTS

| | S _{MAX} | | | CRACK LE | NGTH (IN.) ⁽¹⁾ A OR B |
|-----------------------|------------------|------|---|--|--|
| SPECIMEN | (PSI) | R | CYCLES | a _A | a _B |
| A1 (W = 9.0 IN.) | 12,000 | 0.02 | 0 20,000 30,000 40,000 60,000 70,000 80,000 89,765 | 0.018 ⁽²⁾ 0.018 0.025 0.027 0.031 0.035 0.047 0.064 | 0.014 ⁽²⁾ 0.028 0.040 0.057 0.097 0.117 0.140 0.164 |
| A2 (W = 9.0 IN.) | 12,000 | 0.02 | 0 30,000 40,000 48,819 | 0.014 ⁽²⁾ 0.024 0.040 0.064 | 0.015 ⁽²⁾ 0.024 0.057 0.065 |
| B1 (W = 11.5 IN.) | 12,000 | 0.02 | 0 60,000 70,000 80,272 | 0.018 ⁽²⁾ 0.045 0.051 0.064 | 0.016 ⁽²⁾ 0.016 0.030 0.061 |
| F1 (W = 11.25 IN.) | 10,000 | 0.02 | 0 100,000 130,000 161,000 195,000 220,000 240,000 | 0.006 ⁽³⁾ 0.022 0.054 0.082 0.110 0.135 0.157 | 0.005 ⁽³⁾ 0.018 0.043 0.069 0.090 0.106 0.126 |
| F2 (W = 11.25 IN.) | 10,000 | 0.02 | 0 65,000 85,000 107,500 130,000 167,000 184,400 | 0.006 ⁽³⁾ 0.025 0.040 0.051 0.071 0.100 0.117 | 0.009 ⁽³⁾ 0.038 0.053 0.065 0.092 0.130 0.156 |

^{(1) 3/16-}IN. DIAMETER (2) SAW-CUT NOTCH (3) EDM NOTCH

TABLE C-3 (CONT) CONSTANT AMPLITUDE LOADING CRACK GROWTH DATA FROM PRECRACKING TESTS

| | | | | The second of th | NGTH (IN.) ⁽¹⁾ A OR B |
|-----------------|---------------------------|------|---------|--|-------------------------------------|
| SPECIMEN | S _{MAX} (PSI) | R | CYCLES | a _A | a _B |
| F3 | 10,000 | 0.02 | 0 | 0.006 ⁽²⁾ | 0.006 ⁽²⁾ |
| (W = 11.25 IN.) | | 1 | 88,000 | 0.025 | 0.024 |
| | | | 107,000 | 0.045 | 0.051 |
| | | | 130,000 | 0.060 | 0.077 |
| | ↓ | 1 1 | 169,000 | 0.090 | 0.117 |
| | 10,000 | 0.02 | 195,000 | 0.120 | 0.156 |
| F4 | 10,000 | 0.02 | 0 | 0.006 ⁽²⁾ | 0.008 ⁽²⁾ |
| (W = 11.25 IN.) | | | 65,000 | 0.017 | 0.072 |
| | | | 87,000 | 0.037 | 0.100 |
| | | | 104,700 | 0.056 | 0.117 |
| | | | 123,000 | 0.074 | 0.139 |
| | 10,000 | 0.02 | 138,300 | 0.093 | 0.156 |
| F5 | 10,000 | 0.02 | 0 | _ | 0.008 ⁽²⁾ |
| (W = 11.25 IN.) | 1 | 1 | 72,000 | _ | 0.030 |
| | | | 105,000 | - | 0.049 |
| | | | 130,000 | _ | 0.073 |
| | | | 169,000 | _ | 0.107 |
| | | | 184,400 | - | 0.125 |
| | 10,000 | 0.02 | 202,300 | _ | 0.156 |

^{(1) 3/16-}IN. DIAMETER (2) EDM NOTCH

TABLE C-4 SPECTRUM BS6 TEST CRACK GROWTH DATA **SPECIMENS A1 AND A2**

| | FLIQUE | CRACK | LENGTH (| IN.) AT HOL | E A | CRACK LE | NGTH (IN.) | AT HOL | E B ⁽¹⁾ |
|---------|----------------------|-----------------|---|-------------|-----------------|-----------------------------|-----------------|--------|--------------------|
| CYCLES | FLIGHT HOURS | (a _j | (a _A) _i (a _A) _{OSH} | | (a _E | ₃) _i | (a _B | оѕн | |
| SPECIA | MEN: | A1 | A2 | A1 | A2 | A1 | A2 | A1 | A2 |
| 0 | 0 | 0.030 | 0.033 | | | 0.132 | 0.036 | | |
| 18,247 | 251 | 0.038 | 0.048 | | | 0.144 | 0.043 | | |
| 36,317 | 500 | 0.052 | 0.068 | | | 0.163 | 0.052 | | |
| 54,755 | 753 | 0.068 | 0.083 | | | 0.184 | 0.057 | | |
| 88,355 | 1,216 | 0.110 | 0.122 | | | 0.216 | 0.072 | | |
| 108,905 | 1,499 | 0.141 | 0.149 | | | 0.241 | 0.081 | | |
| 127,205 | 1,750 | 0.169 | 0.173 | | | 0.264 | 0.090 | | |
| 145,280 | 1,999 | 0.193 | 0.200 | | | 0.296 | 0.099 | | |
| 162,905 | 2,242 | 0.222 | 0.225 | | | 0.317 | 0.107 | | |
| 181,955 | 2,504 | 0.256 | 0.254 | | | 0.348 | 0.117 | | |
| 199,825 | 2,750 | 0.288 | 0.287 | | | 0.378 | 0.127 | | |
| 217,957 | 2,999 | 0.320 | 0.328 | | | 0.429 | 0.142 | | |
| 236,405 | 3,253 | 0.370 | 0.370 | | | 0.455 | 0.152 | | |
| 254,265 | 3,499 | 0.411 | 0.411 | | | 0.494 | 0.165 | | |
| 272,415 | 3,748 | 0.461 | 0.466 | | | 0.544 | 0.181 | | |
| 295,285 | 4,063 | 0.517 | 0.524 | | | 0.601 | 0.199 | | |
| 308,855 | 4,250 | 0.555 | 0.566 | | | 0.639 | 0.212 | | |
| 326,930 | 4,499 | 0.609 | 0.634 | | | 0.691 | 0.230 | | |
| 345,230 | 4,750 | 0.659 | 0.690 | | | 0.741 | 0.244 | | |
| 363,605 | 5,003 | 0.719 | 0.762 | | | 0.800 | 0.263 | | |
| 381,475 | 5,249 | 0.798 | 0.873 | | | 0.865 | 0.282 | | 5 |
| 399,607 | 5,499 | 0.868 | 0.994 | | | 0.943 | 0.305 | | |
| 413,055 | 5,752 | 0.958 | 1.142 | | | 1.025 | 0.329 | | |
| 437,255 | 6,017 ⁽²⁾ | 1,063 | 1.359 | 0.266 (1) | 0.734 (3) | 1.110 | 0.353 | (4) | (4) |

⁽¹⁾ FASTENER IN HOLE: NET FIT (0.0001-IN. CLERANCE) TITANIUM HILOK, NO HEAD NOR NUT (2) NO. OF SPECTRUM REPETITIONS = 2.4 (3) NO MEASUREMENT MADE OF THESE CRACKS UNTIL THE END OF TEST (4) NO CRACK VISIBLE

TABLE C-5
SPECTRUM BS1 TEST CRACK GROWTH DATA
SPECIMEN C1

| | 5110117 | | ENGTH (IN.) OLE A | CRACK LENGTH (IN.) AT HOLE B | |
|---------|-----------------------|--------------------------------|----------------------------------|---------------------------------|----------------------------------|
| CYCLES | FLIGHT HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.022 | | 0.035 | |
| 18,000 | 982 | 0.033 | | 0.048 | |
| 36,000 | 1,965 | 0.051 | | 0.066 | |
| 54,000 | 2,947 | 0.073 | | 0.087 | |
| 72,000 | 3,930 | 0.097 | | 0.113 | |
| 90,000 | 4,912 | 0.123 | | 0.139 | |
| 108,000 | 5,895 | 0.148 | | 0.165 | |
| 126,000 | 6,877 | 0.178 | | 0.191 | |
| 144,000 | 7,860 | 0.207 | | 0.219 | 01 |
| 162,000 | 8,842 | 0.239 | | 0.250 | |
| 180,000 | 9,824 | 0.268 | | 0.278 | |
| 198,000 | 10,807 | 0.302 | 1 | 0.312 | |
| 216,000 | 11,789 | 0.340 | 1 | 0.350 | |
| 234,000 | 12,772 | 0.382 | | 0.394 | |
| 252,000 | 13,754 | 0.430 | | 0.445 | |
| 270,000 | 14,737 | 0.475 | | 0.489 | 0.020 |
| 288,000 | 15,719 | 0.530 | | 0.555 | 0.104 |
| 306,000 | 16,701 | 0.576 | | 0.621 | 0.187 |
| 324,000 | 17,684 | 0.627 | 0.043 | 0.699 | 0.276 |
| 342,000 | 18,666 | 0.698 | 0.144 | 0.794 | 0.379 |
| 360,000 | 19,649 | 0.764 | 0.225 | 0.895 | 0.483 |
| 378,000 | 20,631 | 0.855 | 0.325 | 1.030 | 0.618 |
| 396,000 | 21,614 | 0.958 | 0.431 | 1.186 | 0.768 |
| 414,000 | 22,596 ⁽¹⁾ | 1.088 | 0.569 | 1.387 | 0.972 |

TABLE C-6
SPECTRUM BS2 TEST CRACK GROWTH DATA
SPECIMEN C2

| | | CRACK LE | NGTH (IN.) DLE A | CRACK LENGTH (IN.) AT HOLE B | |
|---------|-----------------------|--------------------------------|----------------------------------|---------------------------------|----------------------------------|
| CYCLES | FLIGHT HOURS | (a _A) _i | (a _A) _{OSH} | ^{(а} в) _і | ^{(а} в ⁾ оѕн |
| 0 | 0 | 0.024 | | 0.034 | |
| 18,000 | 4,318 | 0.042 | | 0.051 | |
| 36,000 | 8,636 | 0.062 | | 0.068 | |
| 54,000 | 12,954 | 0.085 | | 0.090 | |
| 72,000 | 17,271 | 0.114 | | 0.103 | |
| 90,000 | 21,589 | 0.134 | | 0.137 | |
| 108,000 | 25,907 | 0.163 | | 0.165 | |
| 126,000 | 30,225 | 0.194 | | 0.194 | |
| 144,000 | 34,543 | 0.228 | | 0.230 | |
| 162,000 | 38,861 | 0.261 | | 0.262 | |
| 180,000 | 43,178 | 0.296 | | 0.296 | |
| 198,000 | 47,496 | 0.332 | | 0.336 | |
| 216,000 | 51,814 | 0.372 | | 0.368 | |
| 234,000 | 56,132 | 0.414 | | 0.408 | |
| 252,000 | 60,450 | 0.459 | | 0.453 | |
| 270,000 | 64,768 | 0.504 | | 0.496 | |
| 288,000 | 69,085 | 0.554 | | 0.544 | |
| 306,000 | 73,403 | 0.607 | 0.018 | 0.596 | 0.094 |
| 324,000 | 77,721 | 0.669 | 0.141 | 0.656 | 0.182 |
| 342,000 | 82,039 | 0.745 | 0.235 | 0.734 | 0.274 |
| 360,000 | 86,357 | 0.832 | 0.334 | 0.822 | 0.374 |
| 378,000 | 90,675 | 0.935 | 0.441 | 0.928 | 0.485 |
| 396,000 | 94,992 ⁽¹⁾ | 1.062 | 0.569 | 1.060 | 0.618 |

TABLE C-7 SPECTRUM BS3 TEST CRACK GROWTH DATA SPECIMENS C3 AND D22

SPECIMEN C3:

| | FLIGHT | | NGTH (IN.) OLE A | CRACK LEI | |
|------------------------|----------------------|--------------------------------|----------------------------------|--------------------------------|----------------------|
| CYCLES | HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B)osh |
| 0 | 0 | 0.030 | | 0.033 | |
| 18,000 | 69 | 0.041 | | 0.045 | |
| 36,000 | 139 | 0.056 | | 0.061 | |
| 54,000 | 208 | 0.076 | | 0.082 | |
| 72,000 | 277 | 0.096 | | 0.106 | |
| 90,000 | 347 | 0.119 | | 0.130 | |
| 108,000 | 416 | 0.137 | | 0.153 | |
| 126,000 | 485 | 0.163 | | 0.184 | |
| 144,000 | 554 | 0.202 | | 0.220 | |
| 162,000 | 624 | 0.233 | | 0.265 | |
| 180,000 | 693 | 0.261 | | 0.281 | |
| 198,000 ⁽¹⁾ | 762 | 0.290 | | 0.317 | |
| 216,000 | 832 | 0.308 | | 0.335 | |
| 234,000 | 901 | 0.312 | | 0.340 | |
| 252,000 | 970 | 0.316 | | 0.346 | |
| 270,000 | 1,040 | 0.319 | | 0.352 | |
| 288,000 | 1,109 | 0.329 | | 0.370 | |
| 306,000 | 1,178 | 0.347 | | 0.400 | |
| 324,000 | 1,247 | 0.371 | | 0.432 | |
| 342,000 | 1,317 | 0.403 | | 0.466 | |
| 360,000 | 1,386 | 0.437 | | 0.503 | |
| 378,000 | 1,455 | 0.469 | | 0.537 | |
| 396,000 | 1,525 | 0.515 | | 0.577 | |
| 414,000 | 1,594 | 0.551 | | 0.627 | |
| 432,000 | 1,663 ⁽²⁾ | 0.600 | (3) | 0.687 | (3) |

⁽¹⁾ PEAK OVERLOAD > 31,000 PSI INADVERTENTLY APPLIED TWICE AFTER 198,000 CYCLES (2) NO. OF SPECTRUM REPETITIONS = 0.7 (3) NO CRACK VISIBLE

TABLE C-7 (CONT) SPECTRUM BS3 TEST CRACK GROWTH DATA SPECIMENS C3 AND D22

SPECIMEN D22:

| | FLIGHT | | ENGTH (IN.) OLE A | CRACK LEI | |
|---------|----------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|
| CYCLES | HOURS | (a _A) _i | ^{(a} A ⁾ osh | (a _B) _i | ^{(а} в ⁾ оѕн |
| 0 | 0 | 0.029 | | 0.028 | |
| 20,000 | 77 | 0.044 | | 0.040 | |
| 42,480 | 164 | 0.064 | | 0.060 | |
| 60,000 | 231 | 0.082 | | 0.071 | |
| 80,000 | 308 | 0.101 | | 0.093 | |
| 100,000 | 385 | 0.120 | | 0.105 | |
| 120,000 | 462 | 0.141 | | 0.123 | |
| 140,000 | 539 | 0.165 | | 0.148 | |
| 160,000 | 616 | 0.191 | | 0.168 | |
| 180,000 | 693 | 0.218 | | 0.193 | |
| 200,000 | 770 | 0.246 | | 0.220 | |
| 220,000 | 847 | 0.275 | | 0.248 | |
| 240,000 | 924 | 0.313 | | 0.279 | |
| 260,000 | 1,001 | 0.347 | | 0.309 | |
| 280,000 | 1,078 | 0.384 | | 0.344 | |
| 300,000 | 1,155 | 0.425 | | 0.384 | |
| 320,000 | 1,232 | 0.469 | | 0.420 | |
| 340,000 | 1,309 | 0.516 | | 0.462 | |
| 360,000 | 1,386 | 0.570 | | 0.509 | |
| 380,000 | 1,463 | 0.632 | 0.122 | 0.551 | |
| 400,000 | 1,540 | 0.718 | 0.231 | 0.607 | |
| 420,000 | 1,617 | 0.813 | 0.336 | 0.657 | |
| 440,000 | 1,694 | 0.925 | 0.453 | 0.726 | |
| 460,000 | 1,771 | 1.067 | 0.594 | 0.799 | 0.005 |
| 480,000 | 1,848 | 1.235 | 0.760 | 0.879 | 0.144 |
| 492,560 | 1,896 | 1.377 | 0.900 | 0.946 | 0.225 |
| 500,000 | 1,925 | 1.472 | 0.996 | 0.988 | 0.273 |
| 510,000 | 1,964 ⁽¹⁾ | 1.614 | 1.139 | 1.049 | 0.336 |

TABLE C-8
SPECTRUM BS4 TEST CRACK GROWTH DATA
SPECIMEN C4

| CYCLES | FLIGHT - | CRACK LE AT HO | NGTH (IN.) DLE A | CRACK LENGTH (IN.) AT HOLE B | |
|---------|----------------------|--------------------------------|----------------------------------|---------------------------------|----------------------------------|
| | HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.030 | | 0.031 | |
| 18,000 | 226 | 0.044 | | 0.045 | |
| 36,000 | 452 | 0.057 | | 0.057 | , |
| 54,000 | 678 | 0.072 | | 0.072 | |
| 72,000 | 904 | 0.090 | | 0.095 | |
| 90,000 | 1,130 | 0.110 | | 0.112 | |
| 108,000 | 1,356 | 0.128 | | 0.128 | |
| 126,000 | 1,583 | 0.154 | | 0.152 | |
| 144,000 | 1,809 | 0.178 | | 0.175 | |
| 162,000 | 2,035 | 0.203 | | 0.205 | |
| 180,000 | 2,261 | 0.229 | | 0.231 | |
| 198,000 | 2,487 | 0.256 | | 0.256 | |
| 216,000 | 2,713 | 0.294 | | 0.293 | |
| 234,000 | 2,939 | 0.330 | | 0.324 | |
| 252,000 | 3,165 | 0.365 | 0.071 | 0.358 | |
| 270,000 | 3,391 | 0.411 | 0.130 | 0.397 | 0.043 |
| 288,000 | 3,617 | 0.455 | 0.177 | 0.436 | 0.089 |
| 306,000 | 3,843 | 0.496 | 0.224 | 0.472 | 0.131 |
| 324,000 | 4,069 | 0.554 | 0.283 | 0.524 | 0.180 |
| 342,000 | 4,296 | 0.610 | 0.347 | 0.573 | 0.237 |
| 360,000 | 4,522 | 0.690 | 0.427 | 0.644 | 0.309 |
| 378,000 | 4,748 | 0.764 | 0.503 | 0.713 | 0.381 |
| 396,000 | 4,974 | 0.863 | 0.603 | 0.800 | 0.470 |
| 414,000 | 5,200 | 0.981 | 0.729 | 0.909 | 0.568 |
| 432,000 | 5,426 ⁽¹⁾ | 1.128 | 0.780 | 1.030 | 0.666 |

TABLE C-9 SPECTRUM BS5 TEST CRACK GROWTH DATA SPECIMEN C6

| | FLICHT | | ENGTH (IN.) OLE A | CRACK LEI | |
|---------|-----------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|
| CYCLES | FLIGHT HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.032 | | 0.0 ⁽¹⁾ | |
| 18,900 | 240 | 0.043 | | (2) | |
| 36,880 | 468 | 0.049 | | (2) | |
| 54,880 | 696 | 0.061 | | 0.026 | |
| 72,880 | 924 | 0.071 | | 0.042 | |
| 90,880 | 1,152 | 0.086 | | 0.061 | |
| 108,800 | 1,380 | 0.095 | 1 | 0.069 | |
| 126,800 | 1,608 | 0.107 | 1 | 0.080 | |
| 144,910 | 1,837 | 0.114 | | 0.093 | |
| 162,910 | 2,066 | 0.125 | | 0.102 | |
| 180,920 | 2,294 | 0.135 | | 0.116 | |
| 198,920 | 2,522 | 0.145 | | 0.131 | |
| 216,900 | 2,750 | 0.157 | 1 | 0.145 | |
| 234,910 | 2,979 | 0.170 | | 0.158 | |
| 252,900 | 3,207 | 0.197 | | 0.189 | |
| 302,789 | 3,839 | 0.222 | | 0.215 | |
| 334,090 | 4,236 | 0.249 | | 0.241 | |
| 370,150 | 4,694 | 0.279 | | 0.272 | |
| 406,150 | 5,150 | 0.319 | | 0.313 | |
| 442,430 | 5,610 | 0.351 | | 0.347 | |
| 460,150 | 5,835 | 0.375 | | 0.371 | |
| 496,150 | 6,291 | 0.420 | | 0.416 | |
| 532,150 | 6,748 | 0.463 | | 0.457 | |
| 568,150 | 7,204 | 0.517 | | 0.508 | |
| 610,000 | 7,735 | 0.589 | | 0.570 | |
| 640,170 | 8,117 | 0.637 | | 0.624 | |
| 676,150 | 8,574 | 0.710 | | 0.691 | |
| 712,160 | 9,030 | 0.795 | | 0.778 | |
| 748,150 | 9,487 | 0.893 | | 0.875 | |
| 784,150 | 9,943 | 1.018 | | 0.998 | |
| 802,150 | 10,171 ⁽³⁾ | 1.086 | (4) | 1.063 | (4) |

 ⁽¹⁾ FROM FRACTURE SURFACE MEASUREMENT a_O = 0.0075 ON OTHER SIDE OF SPECIMEN
 (2) NO MEASUREMENT MADE
 (3) NO. OF SPECTRUM REPETITIONS = 4.1
 (4) NO CRACK VISIBLE. HOWEVER, FROM FRACTURE SURFACE MEASUREMENT, (a_A)_{OSH} = 0.115 ON OTHER SIDE OF SPECIMEN (0.21 DEPTH)

TABLE C-10 SPECTRUM BS4.MM8 TEST CRACK GROWTH DATA SPECIMEN C7

| | FLIGHT | | ENGTH (IN.) IOLE A | CRACK LENGTH (IN.) AT HOLE B | | |
|---------|----------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|--|
| CYCLES | HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSF} | |
| 0 | 0 | 0.022 | | 0.030 | | |
| 18,000 | 181 | 0.038 | | 0.043 | | |
| 36,000 | 363 | 0.050 | | 0.054 | | |
| 55,800 | 562 | 0.069 | | 0.072 | | |
| 72,000 | 725 | 0.080 | | 0.081 | | |
| 90,000 | 906 | 0.096 | | 0.098 | | |
| 108,000 | 1,088 | 0.111 | | 0.113 | | |
| 126,000 | 1,269 | 0.129 | | 0.131 | | |
| 144,280 | 1,453 | 0.146 | | 0.150 | | |
| 162,000 | 1,631 | 0.163 | | 0.168 | | |
| 180,000 | 1,813 | 0.187 | | 0.195 | | |
| 198,000 | 1,994 | 0.212 | | 0.221 | | |
| 216,000 | 2,175 | 0.237 | | 0.247 | | |
| 234,000 | 2,356 | 0.261 | | 0.272 | | |
| 252,000 | 2,538 | 0.286 | | 0.297 | | |
| 270,000 | 2,719 | 0.310 | | 0.323 | | |
| 288,000 | 2,900 | 0.338 | | 0.348 | | |
| 306,000 | 3,081 | 0.368 | | 0.380 | | |
| 324,000 | 3,263 | 0.389 | | 0.401 | | |
| 342,000 | 3,444 | 0.425 | | 0.439 | | |
| 360,000 | 3,625 | 0.449 | 0.057 | 0.466 | 0.024 | |
| 378,000 | 3,806 | 0.492 | 0.094 | 0.503 | 0.107 | |
| 396,000 | 3,988 | 0.542 | 0.145 | 0.570 | 0.175 | |
| 414,000 | 4,169 | 0.590 | 0.188 | 0.625 | 0.234 | |
| 432,240 | 4,353 | 0.670 | 0.262 | 0.723 | 0.337 | |
| 450,000 | 4,532 | 0.754 | 0.350 | 0.820 | 0.437 | |
| 468,000 | 4,713 | 0.838 | 0.432 | 0.918 | 0.536 | |
| 486,000 | 4,894 | 0.946 | 0.543 | 1.050 | 0.665 | |
| 504,000 | 5,075 ⁽¹⁾ | 1.054 | 0.654 | 1.181 | 0.798 | |

TABLE C-11 SPECTRUM BS6.MM13 TEST CRACK GROWTH DATA **SPECIMEN D12**

| | FLIGHT | CRACK LENGTH (IN.) AT HOLE A | | CRACK LENGTH (IN.) AT HOLE B | |
|---------|-----------------------|---------------------------------|----------------------------------|---------------------------------|----------------------|
| CYCLES | HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B)osh |
| 0 | 0 | 0.035 | | 0.0 ⁽¹⁾ | |
| 24,000 | 1,156 | 0.053 | | | |
| 48,000 | 2,312 | 0.075 | | | |
| 72,000 | 3,468 | 0.102 | | | |
| 102,400 | 4,933 | 0.137 | | | |
| 120,000 | 5,780 | 0.161 | | | |
| 144,000 | 6,936 | 0.195 | | | |
| 168,100 | 8,097 | 0.228 | 1 | | |
| 192,000 | 9,249 | 0.267 | 1 | | |
| 216,000 | 10,405 | 0.305 | | | |
| 240,000 | 11,561 | 0.346 | | | |
| 288,000 | 13,873 | 0.442 | | | |
| 312,000 | 15,029 | 0.498 | 0.035 | | |
| 336,000 | 16,185 | 0.559 | 0.073 | | |
| 360,000 | 17,341 | 0.641 | 0.173 | | |
| 384,000 | 18,497 | 0.737 | 0.272 | | |
| 408,000 | 19,653 | 0.859 | 0.393 | | |
| 432,000 | 20,809 | 1.004 | 0.534 | | |
| 440,000 | 21,195 ⁽²⁾ | 1.058 | 0.587 | (1) (3) | (1) |

⁽¹⁾ NO CRACK VISIBLE (2) NO. OF SPECTRUM REPETITIONS = 8.5 (3) FROM FRACTURE SURFACE MEASUREMENT a = 0.07 (0.205 DEPTH) ON OTHER SIDE OF SPECIMEN

TABLE C-12 SPECTRUM BS1B.FL3 TEST CRACK GROWTH DATA SPECIMEN D1

| CYCLES | 5 LOUT | CRACK LE AT HO | NGTH (IN.) DLE A | CRACK LENGTH (IN.) AT HOLE B | |
|---------|-----------------------|--------------------------------|----------------------------------|---------------------------------|----------------------------------|
| | FLIGHT HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.015 ⁽¹⁾ | | 0.029 | |
| 16,000 | 2,192 | 0.021 | | 0.044 | |
| 32,000 | 4,385 | 0.034 | | 0.065 | |
| 48,000 | 6,577 | 0.045 | | 0.091 | |
| 64,000 | 8,769 | 0.061 | | 0.118 | |
| 80,000 | 10,962 | 0.082 | | 0.147 | |
| 96,000 | 13,154 | 0.104 | | 0.177 | |
| 112,000 | 15,346 | 0.124 | | 0.217 | |
| 128,000 | 17,539 | 0.147 | | 0.249 | |
| 144,000 | 19,731 | 0.172 | | 0.287 | |
| 160,000 | 21,923 | 0.197 | | 0.327 | |
| 176,000 | 24,116 | 0.224 | | 0.373 | |
| 192,000 | 26,308 | 0.254 | | 0.423 | |
| 208,000 | 28,500 | 0.294 | | 0.477 | |
| 224,000 | 30,692 | 0.334 | | 0.541 | |
| 240,000 | 32,885 | 0.379 | | 0.625 | 0.154 |
| 256,000 | 35,077 | 0.431 | 0.042 | 0.728 | 0.285 |
| 272,000 | 37,269 | 0.487 | 0.059 | 0.852 | 0.418 |
| 288,000 | 39,462 | 0.551 | 0.100 | 1.018 | 0.584 |
| 304,000 | 41,654 | 0.637 | 0.168 | 1.243 | 0.817 |
| 320,000 | 43,846 | 0.745 | 0.305 | 1.622 | 1.186 |
| 324,000 | 44,394 ⁽²⁾ | 0.773 | 0.342 | 1.738 | 1.293 |

⁽¹⁾ FROM FRACTURE SURFACE MEASUREMENT, ALSO, a $_{\rm o}$ = 0 ON OTHER SIDE OF SPECIMEN (2) NO. OF SPECTRUM REPETITIONS = 17.8

TABLE C-13 SPECTRUM BS6.ES4 TEST CRACK GROWTH DATA SPECIMEN D7

| | 5110117 | CRACK LENGTH (IN.) AT HOLE A | | CRACK LENGTH (IN.) AT HOLE B | |
|------------------------|----------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|
| CYCLES | FLIGHT HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.016 ⁽¹⁾ | | 0.029 | |
| 18,000 | 383 | 0.020 | | 0.043 | |
| 36,000 | 766 | 0.029 | | 0.057 | |
| 54,000 | 1,149 | 0.042 | | 0.071 | |
| 72,000 | 1,531 | 0.059 | | 0.090 | |
| 90,400 | 1,923 | 0.075 | | 0.109 | |
| 108,000 | 2,297 | 0.091 | | 0.123 | |
| 127,200 | 2,701 | 0.108 | | 0.147 | |
| 144,000 | 3,063 | 0.128 | | 0.167 | |
| 162,000 | 3,446 | 0.137 | | 0.186 | |
| 180,000 | 3,829 | 0.161 | | 0.209 | |
| 198,000 | 4,211 | 0.182 | | 0.230 | |
| 216,000 | 4,594 | 0.204 | | 0.256 | |
| 234,000 | 4,977 | 0.227 | | 0.284 | |
| 252,000 | 5,360 | 0.255 | | 0.312 | |
| 270,000 | 5,743 | 0.277 | | 0.343 | |
| 288,000 | 6,126 | 0.301 | | 0.369 | |
| 306,000 | 6,509 | 0.332 | | 0.408 | |
| 324,000 | 6,891 | 0.359 | | 0.443 | |
| 342,000 | 7,274 | 0.387 | | 0.478 | |
| 360,000 | 7,657 | 0.416 | | 0.518 | 0.016 |
| 378,000 | 8,040 | 0.447 | | 0.558 | 0.023 |
| 393,733 ⁽²⁾ | 8,375 ⁽³⁾ | 0.475 | (4) | 0.600 | 0.072 |

⁽¹⁾ FROM FRACTURE SURFACE MEASUREMENT, ALSO, a_0 = 0 ON OTHER SIDE OF SPECIMEN

⁽²⁾ TEST TERMINATED BECAUSE OF FRETTING-INITIATED FAILURE IN THE GRIP END (3) NO. OF SPECTRUM REPETITIONS = 3.3 (4) NO CRACK VISIBLE

TABLE C-14
SPECTRUM BS6.DSL1 TEST CRACK GROWTH DATA
SPECIMEN D6

| CYCLES | FLIGHT | | ENGTH (IN.) IOLE A | CRACK LENGTH (IN.) AT HOLE B | |
|---------|----------------------|--------------------------------|----------------------------------|---------------------------------|----------------------------------|
| | HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.023 | | 0.030 | |
| 16,000 | 220 | 0.037 | | 0.043 | |
| 32,000 | 440 | 0.057 | | 0.057 | |
| 48,000 | 660 | 0.077 | | 0.072 | |
| 64,000 | 881 | 0.101 | | 0.089 | |
| 80,000 | 1,101 | 0.125 | | 0.109 | |
| 96,000 | 1,321 | 0.153 | | 0.131 | |
| 112,000 | 1,541 | 0.195 | | 0.155 | |
| 128,000 | 1,761 | 0.212 | | 0.177 | |
| 144,000 | 1,981 | 0.246 | | 0.199 | |
| 160,000 | 2,202 | 0.280 | | 0.229 | |
| 176,000 | 2,422 | 0.318 | | 0.260 | |
| 192,000 | 2,642 | 0.353 | | 0.288 | |
| 208,000 | 2,862 | 0.400 | | 0.326 | |
| 224,000 | 3,082 | 0.450 | | 0.368 | 0.044 |
| 240,000 | 3,302 | 0.502 | 0.019 | 0.419 | 0.084 |
| 256,000 | 3,523 | 0.570 | 0.036 | 0.482 | 0.140 |
| 272,000 | 3,743 | 0.655 | 0.081 | 0.556 | 0.218 |
| 288,000 | 3,963 | 0.757 | 0.218 | 0.649 | 0.311 |
| 304,000 | 4,183 | 0.891 | 0.363 | 0.767 | 0.435 |
| 320,000 | 4,403 | 1.068 | 0.529 | 0.924 | 0.598 |
| 330,000 | 4,541 ⁽¹⁾ | 1.216 | 0.683 | 1.054 | 0.733 |

TABLE C-15 SPECTRUM BS6.DSL3 TEST CRACK GROWTH DATA **SPECIMEN D17**

| | FLIGHT | CRACK LE | | CRACK LEN | |
|-----------|-----------------------|--------------------------------|----------------------------------|-------------------|----------------------------------|
| CYCLES | HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) | (a _B) _{OSH} |
| 0 | 0 | 0.007 ⁽¹⁾ | | 0.026 | |
| 24,000 | 330 | 0.008 | | 0.032 | |
| 49,280 | 678 | 0.010 | | 0.035 | |
| 72,000 | 991 | 0.014 | | 0.042 | |
| 96,000 | 1,321 | 0.019 | | 0.045 | |
| 120,000 | 1,651 | 0.020 | | 0.050 | |
| 144,000 | 1,981 | 0.022 | | 0.057 | |
| 168,000 | 2,312 | 0.026 | | 0.062 | |
| 192,000 | 2,642 | 0.031 | | 0.071 | |
| 216,000 | 2,972 | 0.036 | | 0.079 | |
| 264,000 | 3,633 | 0.043 | | 0.095 | |
| 312,000 | 4,293 | 0.052 | | 0.112 | |
| 360,000 | 4,954 | 0.066 | | 0.130 | |
| 408,000 | 5,614 | 0.080 | | 0.151 | |
| 456,000 | 6,275 | 0.090 | | 0.167 | |
| 504,320 | 6,939 | 0.113 | | 0.190 | |
| 552,000 | 7,596 | 0.133 | | 0.212 | |
| 600,000 | 8,256 | 0.153 | | 0.238 | |
| 648,000 | 8,916 | 0.175 | | 0.265 | |
| 696,000 | 9,577 | 0.200 | | 0.297 | |
| 744,000 | 10,237 | 0.222 | | 0.325 | |
| 792,000 | 10,898 | 0.249 | | 0.359 | |
| 840,000 | 11,558 | 0.280 | 1 | 0.396 | |
| 888,000 | 12,219 | 0.312 | 1 | 0.437 | |
| 936,000 | 12,879 | 0.344 | | 0.480 | |
| 984,000 | 13,540 | 0.381 | | 0.527 | |
| 1,032,000 | 14,200 | 0.421 | 1 | 0.580 | |
| 1,057,920 | 14,557 | 0.442 | 1 | 0.612 | |
| 1,104,000 | 15,191 | 0.481 | | 0.665 | |
| 1,152,000 | 15,852 ⁽²⁾ | 0.531 | (3) | 0.726 | (3) |

⁽¹⁾ FROM FRACTURE SURFACE MEASUREMENT a $_{\rm O}$ = 0.018 AT THE OTHER SIDE OF SPECIMEN (2) NO. OF SPECTRUM REPETITIONS = 6.3 (3) NO CRACK VISIBLE

TABLE C-16 SPECTRUM BS6.DSL4 TEST CRACK GROWTH DATA SPECIMEN D3

| CYCLES | FLIGHT | | ENGTH (IN.) OLE A | CRACK LENGTH (IN.) AT HOLE B | |
|---------|----------|--------------------------------|----------------------------------|---------------------------------|----------------------------------|
| | HOURS | (a _A) _i | ^{(a} A ⁾ OSH | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.017 | | 0.027 | |
| 8,000 | 110 | 0.027 | | 0.041 | |
| 16,000 | 220 | 0.039 | | 0.044 | |
| 24,000 | 330 | 0.058 | | 0.056 | |
| 32,000 | 440 | 0.079 | | 0.072 | |
| 40,000 | 550 | 0.103 | | 0.095 | |
| 48,000 | 660 | 0.127 | | 0.118 | |
| 56,000 | 771 | 0.154 | | 0.142 | |
| 64,000 | 881 | 0.178 | | 0.167 | |
| 72,000 | 991 | 0.208 | | 0.192 | |
| 80,000 | 1,101 | 0.241 | | 0.221 | |
| 88,300 | 1,215 | 0.276 | | 0.255 | |
| 96,000 | 1,321 | 0.313 | | 0.293 | |
| 104,000 | 1,431 | 0.357 | | 0.339 | |
| 112,000 | 1,541 | 0.407 | 0.046 | 0.381 | |
| 120,000 | 1,651 | 0.458 | 0.085 | 0.427 | |
| 128,000 | 1,761 | 0.512 | 0.132 | 0.475 | |
| 136,000 | 1,871 | 0.586 | 0.178 | 0.540 | 0.101 |
| 144,000 | 1,981 | 0.684 | 0.303 | 0.624 | 0.196 |
| 152,000 | 2,092 | 0.788 | 0.421 | 0.721 | 0.298 |
| 160,000 | 2,202 | 0.929 | 0.558 | 0.842 | 0.421 |
| 168,000 | 2,312 | 1.072 | 0.698 | 0.962 | 0.543 |
| 176,000 | 2,422(1) | 1.362 | 0.975 | 1.189 | 0.772 |

TABLE C-17 SPECTRUM BS3.VPC1 TEST CRACK GROWTH DATA SPECIMEN D4

| | 5 | | CRACK LENGTH (IN.) AT HOLE A | | NGTH (IN.) OLE B |
|---------|----------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|
| CYCLES | FLIGHT HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.015 | | 0.026 | |
| 16,000 | 103 | 0.033 | | 0.042 | |
| 32,000 | 206 | 0.058 | | 0.062 | |
| 48,000 | 309 | 0.091 | | 0.088 | |
| 64,000 | 412 | 0.120 | | 0.108 | |
| 80,000 | 514 | 0.155 | | 0.134 | |
| 96,000 | 617 | 0.197 | | 0.162 | |
| 112,000 | 720 | 0.239 | | 0.196 | 1 |
| 128,000 | 823 | 0.288 | | 0.235 | 1 |
| 144,000 | 926 | 0.340 | | 0.274 | |
| 160,000 | 1,029 | 0.400 | | 0.322 | |
| 176,000 | 1,132 | 0.462 | | 0.369 | |
| 192,000 | 1,235 | 0.535 | | 0.426 | |
| 208,000 | 1,337 | 0.621 | | 0.498 | |
| 224,000 | 1,440 | 0.730 | 0.035 | 0.579 | |
| 240,000 | 1,543 | 0.844 | 0.122 | 0.662 | |
| 256,000 | 1,646 | 1.007 | 0.300 | 0.768 | 0.015 |
| 272,000 | 1,749 | 1.256 | 0.552 | 0.921 | 0.263 |
| 282,210 | 1,815 ⁽¹⁾ | 1.457 | 0.749 | 1.036 | 0.393 |

TABLE C-18 SPECTRUM BS3.LLT1 TEST CRACK GROWTH DATA SPECIMEN D8

| | FLIGHT | The state of the s | ENGTH (IN.) IOLE A | CRACK LENGTH (IN.) AT HOLE B | |
|------------------------|----------------------|--|----------------------------------|---------------------------------|----------------------------------|
| CYCLES | HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.0(1) | | 0.029 | |
| 18,000 | 97 | 0.029 | | 0.040 | |
| 36,000 | 193 | 0.042 | | 0.057 | |
| 54,000 | 290 | 0.061 | | 0.076 | |
| 72,000 | 387 | 0.080 | | 0.098 | |
| 92,400 | 496 | 0.100 | | 0.123 | |
| 108,000 | 580 | 0.123 | | 0.147 | |
| 127,200 | 683 | 0.151 | | 0.176 | |
| 144,000 | 773 | 0.178 | | 0.208 | |
| 162,000 | 870 | 0.207 | | 0.240 | |
| 180,000 | 967 | 0.237 | | 0.272 | |
| 198,000 | 1,063 | 0.272 | | 0.310 | |
| 216,000 | 1,160 | 0.309 | | 0.348 | |
| 234,000 | 1,257 | 0.349 | | 0.390 | |
| 252,000 | 1,353 | 0.393 | | 0.438 | |
| 270,000 | 1,450 | 0.437 | | 0.488 | |
| 288,000 | 1,547 | 0.489 | | 0.546 | |
| 306,000 | 1,643 | 0,549 | | 0.601 | |
| 324,000 | 1,740 | 0.625 | 0.142 | 0.668 | |
| 342,000 | 1,837 | 0.709 | 0.250 | 0.737 | |
| 360,000 | 1,933 | 0.813 | 0.367 | 0.812 | 0.028 |
| 378,000 | 2,030 | 0.952 | 0.512 | 0.909 | 0.063 |
| 388,640 ⁽²⁾ | 2,087 ⁽³⁾ | 1.050 | 0.615 | 0.984 | 0.105(4 |

⁽¹⁾ FROM FRACTURE SURFACE MEASUREMENT, $a_0 = 0.015$ AND 0.03 ON THE OTHER SIDE OF SPECIMEN AND THROUGH MOST OF THE THICKNESS

⁽²⁾ TEST TERMINATED BECAUSE OF FRETTING-INITIATED FAILURE IN THE GRIP END (3) NO. OF SPECTRUM REPETITIONS = 0.8 (4) FROM FRACTURE SURFACE MEASUREMENT, DEPTH = 0.20

TABLE C-19 SPECTRUM BS3.LLT2 TEST CRACK GROWTH DATA SPECIMEN E1

| | FLIGHT - | CRACK LENGTH (IN.) AT HOLE A | | CRACK LENGTH (IN.) AT HOLE B | |
|---------|----------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|
| CYCLES | HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | ^{(а} в ⁾ osн |
| 0 | 0 | 0.042 ⁽¹⁾ | | (2) | |
| 20,000 | 43 | 0.054 | | | |
| 42,480 | 91 | 0.065 | | | |
| 60,000 | 128 | 0.078 | | | |
| 80,000 | 171 | 0.096 | | | |
| 100,000 | 214 | 0.114 | | | |
| 120,000 | 257 ′ | 0.134 | | | |
| 140,000 | 300 | 0.158 | | | |
| 160,000 | 342 | 0.180 | | | |
| 180,000 | 385 | 0.205 | | | |
| 200,000 | 428 | 0.233 | | | |
| 220,000 | 471 | 0.259 | | | |
| 240,000 | 514 | 0.293 | | | |
| 260,000 | 556 | 0.323 | | | |
| 280,000 | 599 | 0.361 | | | |
| 300,000 | 642 | 0.399 | | | |
| 320,000 | 685 | 0.439 | | 1 | |
| 340,000 | 728 | 0.470 | | | |
| 360,000 | 770 | 0.526 | | | |
| 380,000 | 813 | 0.578 | | | |
| 400,000 | 856 | 0.632 | | | |
| 420,000 | 899 | 0.694 | | 0.067 | |
| 440,000 | 942 | 0.758 | | 0.102 | |
| 460,000 | 984 | 0.825 | | 0.132 | |
| 480,000 | 1,027 | 0.902 | | 0.158 | |
| 500,000 | 1,070 | 0.991 | 0.082 | 0.189 | |
| 520,000 | 1,113 | 1.109 | 0.239 | 0.215 | |
| 540,000 | 1,156 ⁽³⁾ | 1.266 | 0.410 | 0.247 | (2) |

⁽¹⁾ FROM FRACTURE SURFACE MEASUREMENT $a_{_{
m O}}$ = 0.08 ON THE OTHER SIDE OF SPECIMEN

⁽²⁾ NO CRACK VISIBLE
(3) NO. OF SPECTRUM REPETITIONS = 0.5

TABLE C-20 SPECTRUM BS6.LLT2 TEST CRACK GROWTH DATA SPECIMEN D13

| | | | ENGTH (IN.) OLE A | CRACK LENGTH (IN.) AT HOLE B | |
|---------|----------------------|--------------------------------|----------------------------------|---------------------------------|----------------------------------|
| CYCLES | FLIGHT HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | ^{(а} в ⁾ оѕн |
| 0 | 0 | 0.013 | | 0.034 | |
| 24,000 | 193 | (1) | | 0.045 | |
| 48,000 | 385 | (1) | | 0.055 | |
| 72,000 | 578 | 0.033 | 1 | 0.066 | |
| 102,400 | 822 | 0.045 | 1 | 0.076 | |
| 120,000 | 964 | 0.054 | | 0.093 | |
| 144,000 | 1,156 | 0.080 | | 0.106 | |
| 168,100 | 1,350 | 0.083 | 1 | 0.122 | |
| 192,000 | 1,542 | 0.099 | | 0.147 | |
| 216,000 | 1,734 | 0.110 | | 0.154 | |
| 240,000 | 1,927 | 0.129 | | 0.172 | |
| 288,000 | 2,313 | 0.166 | | 0.209 | |
| 312,000 | 2,505 | 0.187 | | 0.231 | |
| 336,000 | 2,698 | 0.207 | | 0.254 | |
| 360,000 | 2,891 | 0.234 | | 0.280 | |
| 384,000 | 3,084 | 0.255 | 1 | 0.305 | |
| 408,000 | 3,276 | 0.279 | | 0.330 | |
| 432,000 | 3,469 | 0.306 | | 0.356 | |
| 456,000 | 3,662 | 0.337 | | 0.388 | |
| 480,000 | 3,854 | 0.369 | | 0.423 | |
| 504,000 | 4,047 | 0.400 | | 0.460 | |
| 528,000 | 4,240 | 0.437 | | 0.497 | |
| 554,000 | 4,449 | 0.479 | | 0.541 | |
| 578,000 | 4,641 | 0.520 | | 0.582 | |
| 586,000 | 4,706 ⁽²⁾ | 0.533 | (3) | 0.598 | (3) |

⁽¹⁾ NO MEASUREMENT MADE (2) NO. OF SPECTRUM REPETITIONS = 1.9 (3) NO CRACK VISIBLE

TABLE C-21 SPECTRUM BS6.LLT5 TEST CRACK GROWTH DATA SPECIMEN D14

| - | | CRACK LENGTH (IN.) AT HOLE A | | CRACK LENGTH (IN.) AT HOLE B | |
|---------|----------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|
| CYCLES | FLIGHT HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.020 ⁽¹⁾ | | 0.031 | |
| 24,000 | 224 | 0.031 | | 0.044 | |
| 48,000 | 448 | 0.049 | | 0.058 | |
| 72,000 | 672 | 0.072 | | 0.076 | |
| 102,400 | 955 | 0.101 | | 0.096 | |
| 120,000 | 1,120 | 0.123 | | 0.119 | |
| 144,000 | 1,344 | 0.149 | | 0.144 | |
| 168,000 | 1,567 | 0.175 | | 0.168 | |
| 192,000 | 1,791 | 0.207 | | 0.194 | |
| 216,000 | 2,015 | 0.240 | | 0.221 | |
| 240,000 | 2,239 | 0.271 | | 0.249 | |
| 288,000 | 2,687 | 0.348 | | 0.318 | |
| 312,000 | 2,911 | 0.390 | | 0.358 | |
| 336,000 | 3,135 | 0.428 | | 0.407 | |
| 360,000 | 3,359 | 0.492 | | 0.452 | |
| 384,000 | 3,583 | 0.548 | | 0.504 | |
| 408,000 | 3,807 | 0.616 | 0.100 | 0.569 | 0.034 |
| 432,000 | 4,031 | 0.703 | 0.167 | 0.649 | 0.114 |
| 456,000 | 4,254 | 0.788 | 0.247 | 0.730 | 0.174 |
| 480,000 | 4,478 | 0.905 | 0.348 | 0.832 | 0.301 |
| 504,000 | 4,702 | 1.045 | 0.484 | 0.963 | 0.429 |
| 512,000 | 4,777 | 1.110 | 0.546 | 1.017 | 0.482 |
| 516,000 | 4,814 ⁽²⁾ | 1.133 | 0.570 | 1.034 | 0.507 |

⁽¹⁾ FROM FRACTURE SURFACE MEASUREMENT, ALSO a $_{_{0}}$ = 0.30 \rightarrow 0.40 THROUGH THE REST OF SPECIMEN THICKNESS

⁽²⁾ NO. OF SPECTRUM REPETITIONS = 1.9

TABLE C-22 SPECTRUM BS6.LLT6 TEST CRACK GROWTH DATA SPECIMEN D5

| CYCLES | FLIGHT | | ENTH (IN.) IOLE A | CRACK LENGTH (IN.) AT HOLE B | |
|---------|----------------------|--------------------------------|----------------------------------|---------------------------------|----------------------------------|
| | HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.026 | | 0.039 | |
| 16,000 | 340 | 0.039 | | 0.055 | |
| 32,000 | 681 | 0.056 | | 0.071 | |
| 48,000 | 1,021 | 0.078 | | 0.093 | |
| 64,000 | 1,362 | 0.102 | | 0.117 | |
| 80,000 | 1,702 | 0.126 | | 0.141 | |
| 96,000 | 2,043 | 0.152 | | 0.162 | |
| 112,000 | 2,383 | 0.181 | | 0.197 | |
| 128,000 | 2,724 | 0.214 | | 0.224 | |
| 144,000 | 3,064 | 0.241 | | 0.257 | |
| 160,000 | 3,405 | 0.278 | | 0.290 | |
| 176,000 | 3,745 | 0.312 | | 0.327 | |
| 192,000 | 4,086 | 0.358 | | 0.370 | |
| 208,000 | 4,426 | 0.397 | | 0.413 | |
| 224,000 | 4,767 | 0.442 | 0.038 | 0.458 | |
| 240,000 | 5,107 | 0.496 | 0.090 | 0.509 | |
| 256,000 | 5,448 | 0.557 | 0.147 | 0.564 | |
| 272,000 | 5,788 | 0.624 | 0.206 | 0.619 | |
| 288,000 | 6,129 | 0.705 | 0.285 | 0.681 | 0.036 |
| 304,000 | 6,469 | 0.821 | 0.398 | 0.765 | 0.098 |
| 320,000 | 6,810 | 0.968 | 0.542 | 0.866 | 0.198 |
| 336,000 | 7,150 | 1.128 | 0.705 | 0.973 | 0.310 |
| 344,000 | 7,320 ⁽¹⁾ | 0.230 | 0.805 | 1.037 | 0.372 |

TABLE C-23 SPECTRUM BS6.HIL1 TEST GROWTH DATA SPECIMEN C8

| | FLIGHT | | ENGTH (IN.) HOLE A | CRACK LEI AT HO | |
|---------|----------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|
| CYCLES | HOURS | (a _B) _i | (a _B) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.030 | | 0.031 | |
| 18,000 | 248 | 0.043 | | 0.041 | |
| 36,000 | 495 | 0.055 | | 0.052 | |
| 55,800 | 768 | 0.068 | | 0.062 | |
| 72,000 | 991 | 0.082 | | 0.072 | |
| 90,000 | 1,138 | 0.097 | | 0.086 | |
| 108,000 | 1,486 | 0.113 | | 0.100 | |
| 126,000 | 1,734 | 0.127 | | 0.114 | |
| 144,280 | 1,985 | 0.142 | | 0.130 | |
| 162,000 | 2,229 | 0.160 | | 0.146 | |
| 180,000 | 2,477 | 0.180 | | 0.164 | |
| 198,000 | 2,724 | 0.194 | | 0.178 | |
| 216,000 | 2,972 | 0.211 | | 0.198 | |
| 234,000 | 3,220 | 0.237 | | 0.218 | |
| 252,000 | 3,468 | 0.243 | | 0.238 | |
| 270,000 | 3,715 | 0.264 | | 0.262 | |
| 288,000 | 3,963 | 0.281 | | 0.282 | |
| 306,000 | 4,211 | 0.303 | | 0.305 | |
| 324,000 | 4,458 | 0.323 | | 0.333 | |
| 342,000 | 4,706 | 0.346 | | 0.363 | |
| 360,000 | 4,954 | 0.369 | | 0.395 | |
| 378,000 | 5,201 | 0.392 | | 0.427 | |
| 396,000 | 5,449 | 0.440 | | 0.467 | |
| 414,000 | 5,697 | 0.479 | | 0.504 | |
| 432,240 | 5,948 | 0.523 | 0.016 | 0.547 | |
| 450,000 | 6,192 | 0.572 | 0.022 | 0.599 | |
| 468,000 | 6,440 | 0.619 | 0.033 | 0.648 | |
| 486,000 | 6,687 | 0.675 | 0.040/0.053 ⁽¹⁾ | 0.700 | |
| 504,000 | 6,935 | 0.747 | 0.040/0.123 | 0.770 | 0.111 |
| 522,000 | 7,183 | 0.806 | 0.040/0.183 | 0.841 | 0.199 |
| 540,000 | 7,430 | 0.904 | 0.040/0.271 | 0.943 | 0.320 |
| 558,000 | 7,678 | 1.006 | 0.040/0.375 | 1.052 | 0.436 |
| 576,000 | 7,926 ⁽²⁾ | 1.135 | 0.040/0.504 | 1.192 | 0.578 |

⁽¹⁾ SECOND CRACK, FIRST CRACK STOPPED AT 0.04 (2) NO. OF SPECTRUM REPETITIONS = 3.2

TABLE C-24 SPECTRUM BS6.HIL2 TEST CRACK GROWTH DATA SPECIMEN D18

| | FLIGHT | CRACK LENGTH (IN.) AT HOLE A | | CRACK LENGTH (IN.) AT HOLE B | |
|---------|----------------------|--------------------------------|----------------------------------|---------------------------------|----------------------------------|
| CYCLES | HOURS | (a _A) _i | ^{(a} A ⁾ OSH | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.025 | | 0.030 | |
| 24,000 | 330 | 0.040 | | 0.042 | |
| 49,280 | 678 | 0.055 | | 0.056 | |
| 72,000 | 990 | 0.076 | | 0.069 | |
| 96,000 | 1,320 | 0.095 | | 0.086 | |
| 120,000 | 1,650 | 0.113 | | 0.106 | |
| 144,000 | 1,980 | 0.135 | | 0.129 | |
| 168,000 | 2,310 | 0.157 | | 0.146 | |
| 192,000 | 2,640 | 0.181 | | 0.164 | |
| 216,000 | 2,970 | 0.205 | | 0.188 | |
| 264,000 | 3,630 | 0.260 | | 0.239 | |
| 312,000 | 4,290 | 0.319 | | 0.291 | |
| 352,000 | 4,840 | 0.375 | | 0.345 | |
| 384,000 | 5,280 | 0.425 | | 0.392 | |
| 408,000 | 5,610 | 0.466 | | 0.431 | 0.028 |
| 432,000 | 5,940 | 0.512 | | 0.470 | 0.040 |
| 456,000 | 6,270 | 0.565 | | 0.520 | 0.063 |
| 480,000 | 6,600 | 0.626 | 0.025 | 0.575 | 0.096 |
| 504,320 | 6,934 | 0.681 | 0.074 | 0.639 | 0.136 |
| 520,000 | 7,150 | 0.728 | 0.111 | 0.678 | 0.161 |
| 536,000 | 7,370 | 0.776 | 0.158 | 0.725 | 0.191 |
| 552,000 | 7,590 | 0.839 | 0.215 | 0.783 | (2) |
| 568,000 | 7,810 | 0.899 | 0.281 | 0.841 | 0.317 |
| 584,000 | 8,030 | 0.988 | 0.360 | 0.915 | 0.397 |
| 600,000 | 8,250 | 1.062 | 0.440 | 0.992 | 0.476 |
| 608,000 | 8,360 ⁽¹⁾ | 1.105 | 0.486 | 1.034 | 0.522 |

⁽¹⁾ NO. OF SPECTRUM REPETITIONS = 3.3

⁽²⁾ NO MEASUREMENT MADE

TABLE C-25 SPECTRUM BS6.HIL3 TEST CRACK GROWTH DATA SPECIMEN D15

| | - LUQUE | CRACK LENGTH (IN.) AT HOLE A | | CRACK LENGTH (IN.) AT HOLE B | |
|---------|----------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|
| CYCLES | FLIGHT HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.030 | | 0.022 | |
| 24,000 | 330 | 0.050 | | 0.039 | |
| 48,000 | 660 | 0.072 | | 0.061 | |
| 72,000 | 991 | 0.088 | | 0.076 | |
| 102,400 | 1,409 | 0.107 | | 0.092 | |
| 120,000 | 1,651 | 0.117 | | 0.100 | |
| 144,000 | 1,981 | 0.141 | | 0.122 | |
| 168,000 | 2,312 | 0.147 | | 0.122 | |
| 192,000 | 2,642 | 0.159 | | 0.131 | |
| 216,000 | 2,972 | 0.177 | | 0.149 | |
| 240,000 | 3,302 | 0.215 | | 0.184 | |
| 288,000 | 3,962 | 0.246 | | 0.207 | |
| 312,000 | 4,293 | 0.269 | | 0.227 | |
| 336,000 | 4,623 | 0.298 | | 0.247 | |
| 360,000 | 4,954 | 0.307 | | 0.258 | |
| 384,000 | 5,284 | 0.319 | | 0.262 | |
| 408,000 | 5,614 | 0.376 | | 0.305 | 0.020 |
| 432,000 | 5,944 | 0.427 | | 0.360 | 0.084 |
| 456,000 | 6,275 | 0.453 | | 0.383 | 0.112 |
| 480,000 | 6,605 | 0.501 | | 0.437 | 0.174 |
| 504,000 | 6,935 | 0.573 | | 0.521 | 0.261 |
| 516,000 | 7,100 ⁽¹⁾ | 0.624 | 0.066 | 0.580 | 0.321 |

⁽¹⁾ NO. OF SPECTRUM REPETITIONS = 2.8

TABLE C-26 SPECTRUM BS6.HIL4 TEST CRACK GROWTH DATA SPECIMEN D9

| CYCLES | FLICHT | | ENGTH (IN.) OLE A | CRACK LEM | |
|------------------------|----------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|
| | FLIGHT HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.020 | | 0.031 ⁽¹⁾ | |
| 18,000 | 230 | 0.030 | | 0.043 | |
| 36,000 | 459 | 0.042 | | 0.056 | |
| 54,000 | 689 | 0.055 | | 0.073 | |
| 72,000 | 919 | 0.070 | | 0.080 | |
| 90,400 | 1,154 | 0.087 | | 0.094 | |
| 108,000 | 1,378 | 0.105 | | 0.108 | |
| 127,200 | 1,623 | 0.129 | | 0.126 | |
| 144,000 | 1,837 | 0.146 | | 0.144 | |
| 162,000 | 2,067 | 0.162 | | 0.156 | |
| 180,000 | 2,297 | 0.185 | | 0.178 | |
| 198,000 | 2,526 | 0.208 | | 0.197 | |
| 216,000 | 2,756 | 0.237 | | 0.223 | |
| 234,000 | 2,986 | 0.265 | | 0.251 | |
| 252,000 | 3,216 | 0.288 | | 0.278 | |
| 270,000 | 3,445 | 0.314 | | 0.293 | |
| 288,000 | 3,675 | 0.348 | · · | 0.325 | |
| 306,000 | 3,905 | 0.385 | | 0.358 | |
| 324,000 | 4,134 | 0.420 | | 0.389 | |
| 342,000 | 4,364 | 0.438 | | 0.407 | |
| 360,000 | 4,594 | 0.476 | , | 0.441 | |
| 378,000 | 4,823 | 0.509 | 1 | 0.467 | |
| 397,600 | 5,073 | 0.563 | | 0.518 | 0.013 |
| 414,000 | 5,283 | 0.608 | 0.035 | 0.562 | 0.077 |
| 433,200 | 5,528 | 0.651 | 0.064 | 0.605 | 0.136 |
| 450,000 ⁽²⁾ | 5,742 | 0.693 | 0.098 | 0.644 | 0.191 |
| 468,000 | 5,972 | 0.791 | 0.213 | 0.730 | 0.291 |
| 486,000 | 6,201 | 0.912 | 0.344 | 0.847 | 0.422 |
| 504,400 | 6,436 | 1.056 | 0.488 | 0.981 | 0.560 |
| 514,000 | 6,559 ⁽³⁾ | 1.110 | 0.538 | 1.029 | 0.608 |

⁽¹⁾ FROM FRACTURE SURFACE MEASUREMENT, a = 0 AT OTHER SIDE OF SPECIMEN (2) FREQUENCY CHANGED FROM 4.0 TO 4.5 Hz (3) NO. OF SPECTRUM REPETITIONS = 2.6

TABLE C-27
SPECTRUM BS6.HIL5 TEST CRACK GROWTH DATA
SPECIMEN D19

| | EL LOUIT | | ENGTH (IN.) OLE A | | NGTH (IN.) OLE B |
|-----------|-----------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|
| CYCLES | FLIGHT HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.025 | | 0.027 | |
| 24,000 | 330 | 0.037 | | 0.038 | |
| 49,280 | 678 | 0.045 | | 0.049 | |
| 72,000 | 990 | 0.050 | | 0.055 | 7. |
| 96,000 | 1,320 | 0.059 | | 0.062 | |
| 120,000 | 1,650 | 0.065 | | 0.072 | |
| 144,000 | 1,980 | 0.073 | | 0.081 | |
| 168,000 | 2,310 | 0.079 | | 0.088 | |
| 192,000 | 2,640 | 0.089 | | 0.097 | |
| 216,000 | 2,970 | 0.096 | | 0.106 | |
| 264,000 | 3,630 | 0.125 | | 0.125 | |
| 312,000 | 4,290 | 0.134 | | 0.147 | |
| 360,000 | 4,950 | 0.160 | - 1 | 0.173 | |
| 408,000 | 5,610 | 0.186 | | 0.197 | 0.032 |
| 456,000 | 6,270 | 0.222 | 0.051 | 0.234 | 0.063 |
| 480,000 | 6,600 | 0.250 | 0.072 | 0.259 | 0.083 |
| 504,320 | 6,934 | 0.272 | 0.090 | 0.279 | 0.102 |
| 552,000 | 7,590 | 0.315 | 0.131 | 0.322 | 0.146 |
| 600,000 | 8,250 | 0.366 | 0.175 | 0.368 | 0.189 |
| 624,000 | 8,580 | 0.393 | 0.199 | 0.397 | 0.218 |
| 648,000 | 8,910 | 0.427 | 0.249 | 0.428 | 0.252 |
| 672,000 | 9,240 | 0.462 | 0.284 | 0.461 | 0.283 |
| 696,000 | 9,570 | 0.498 | 0.323 | 0.495 | 0.320 |
| 720,000 | 9,900 | 0.530 | 0.354 | 0.524 | 0.348 |
| 744,000 | 10,230 | 0.569 | 0.383 | 0.554 | 0.380 |
| 768,000 | 10,560 | 0.594 | 0.413 | 0.587 | 0.417 |
| 792,000 | 10,890 | 0.627 | 0.453 | 0.622 | 0.450 |
| 816,000 | 11,220 | 0.672 | 0.491 | 0.671 | 0.493 |
| 840,000 | 11,550 | 0.722 | 0.541 | 0.722 | 0.545 |
| 864,000 | 11,880 | 0.764 | 0.584 | 0.766 | 0.589 |
| 888,000 | 12,210 | 0.804 | 0.632 | 0.806 | 0.630 |
| 912,000 | 12,540 | 0.846 | 0.678 | 0.849 | 0.679 |
| 936,000 | 12,870 | 0.871 | 0.701 | 0.875 | 0.698 |
| 960,000 | 13,200 | 0.911 | 0.738 | 0.914 | 0.737 |
| 984,000 | 13,530 | 0.952 | 0.771 | 0.944 | 0.778 |
| 1,008,000 | 13,860 | 1.012 | 0.826 | 1.004 | 0.818 |
| 1,032,000 | 14,190 | 1.081 | 0.900 | 1.073 | 0.904 |
| 1,057,920 | 14,546 ⁽¹⁾ | 1.173 | 0.974 | 1.148 | 0.977 |

TABLE C-28 SPECTRUM BS6.CLP3 TEST CRACK GROWTH DATA SPECIMEN C9

| | FLIGHT | CRACK LE AT HO | NGTH (IN.) DLE A | CRACK LEN | |
|---------|----------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|
| CYCLES | HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.016 ⁽¹⁾ | | 0.030 | |
| 18,000 | 267 | 0.020 | | 0.042 | |
| 36,000 | 535 | 0.027 | | 0.050 | 1 |
| 55,800 | 829 | 0.040 | | 0.059 | |
| 72,000 | 1,070 | 0.050 | | 0.069 | 1 |
| 90,000 | 1,337 | 0.068 | | 0.086 | |
| 108,000 | 1,605 | 0.082 | | 0.104 | |
| 126,000 | 1,872 | 0.096 | | 0.119 | 1 |
| 144,280 | 2,144 | 0.113 | | 0.134 | |
| 162,000 | 2,407 | 0.129 | | 0.151 | |
| 180,000 | 2,675 | 0.145 | | 0.170 | 1 |
| 198,000 | 2,942 | 0.166 | | 0.193 | |
| 216,000 | 3,210 | 0.183 | | 0.212 | 1 |
| 234,000 | 3,477 | 0.202 | | 0.235 | |
| 252,000 | 3,745 | 0.228 | | 0.263 | |
| 270,000 | 4,012 | 0.257 | | 0.292 | 1 |
| 288,000 | 4,280 | 0.283 | | 0.322 | |
| 306,000 | 4,547 | 0.312 | | 0.352 | |
| 324,000 | 4,815 | 0.340 | | 0.382 | |
| 342,000 | 5,082 | 0.374 | | 0.422 | |
| 360,000 | 5,350 | 0.412 | | 0.459 | |
| 378,000 | 5,617 | 0.451 | | 0.496 | 1 |
| 396,000 | 5,885 | 0.491 | | 0.538 | |
| 414,000 | 6,152 | 0.534 | | 0.584 | 1 |
| 432,240 | 6,423 | 0.587 | | 0.641 | 1 |
| 450,000 | 6,687 | 0.647 | | 0.703 | |
| 468,000 | 6,954 | 0.702 | | 0.758 | |
| 486,000 | 7,222 | 0.769 | | 0.825 | |
| 504,000 | 7,489 | 0.847 | | 0.905 | |
| 522,000 | 7,757 | 0.918 | | 0.976 | |
| 540,000 | 8,024 | 1.004 | | 1.057 | |
| 558,000 | 8,292 ⁽²⁾ | 1.107 | 0.160 | 1.146 | (3) |

⁽¹⁾ FROM FRACTURE SURFACE MEASUREMENT, ALSO, a $_{\rm o}$ = 0 ON OTHER SIDE OF SPECIMEN (2) NO. OF SPECTRUM REPETITIONS = 3.3

⁽³⁾ NO CRACK VISIBLE

TABLE C-29
SPECTRUM BS1.MISC9 TEST CRACK GROWTH DATA SPECIMEN C10

| | FLIQUE | | ENGTH (IN.) OLE A | CRACK LENGTH (IN.) AT HOLE B | |
|---------|-----------------------|--------------------------------|----------------------------------|---------------------------------|----------------------|
| CYCLES | FLIGHT HOURS | (a _A) _i | ^{(a} A ⁾ OSH | (a _B) _i | (a _B)osh |
| 0 | 0 | 0.026 | | 0.030 | |
| 18,000 | 794 | 0.049 | | 0.053 | |
| 36,000 | 1,587 | 0.071 | | 0.075 | |
| 55,800 | 2,460 | 0.097 | | 0.104 | |
| 72,000 | 3,174 | 0.122 | | 0.131 | |
| 90,000 | 3,968 | 0.149 | | 0.162 | |
| 108,000 | 4,762 | 0.183 | | 0.195 | |
| 126,000 | 5,555 | 0.220 | | 0.233 | , |
| 144,280 | 6,361 | 0.256 | | 0.272 | |
| 162,000 | 7,143 | 0.297 | | 0.313 | |
| 180,000 | 7,936 | 0.344 | | 0.363 | |
| 198,000 | 8,730 | 0.394 | | 0.416 | |
| 216,000 | 9,523 | 0.444 | | 0.476 | 0.068 |
| 234,000 | 10,317 | 0.506 | | 0.555 | 0.167 |
| 252,000 | 11,111 | 0.573 | | 0.651 | 0.274 |
| 270,000 | 11,904 | 0.654 | 0.075 | 0.772 | 0.398 |
| 288,000 | 12,698 | 0.756 | 0.174 | 0.930 | 0.560 |
| 306,000 | 13,492 | 0.880 | 0.314 | 1.136 | 0.767 |
| 324,000 | 14,285 ⁽¹⁾ | 1.035 | 0.476 | 1.405 | 1.036 |

⁽¹⁾ NO. OF SPECTRUM REPETITIONS = 5.7

TABLE C-30 SPECTRUM BS6.MISC2 TEST CRACK GROWTH DATA **SPECIMEN D16**

| CYCLES | FLIGHT | CRACK LENGTH (IN.) AT HOLE A | | CRACK LENGTH (IN.) AT HOLE B | |
|---------|----------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|
| | HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSF} |
| 0 | 0 | 0.005 ⁽¹⁾ | | 0.031 | |
| 24,000 | 160 | 0.014 | | 0.043 | |
| 48,000 | 319 | 0.031 | | 0.057 | |
| 72,000 | 479 | 0.048 | | 0.071 | |
| 102,400 | 681 | 0.071 | | 0.092 | |
| 120,000 | 798 | 0.082 | | 0.102 | |
| 144,000 | 958 | 0.097 | | 0.114 | |
| 168,000 | 1,117 | 0.120 | | 0.135 | |
| 192,000 | 1,277 | 0.141 | | 0.160 | |
| 216,000 | 1,436 | 0.162 | | 0.179 | |
| 240,000 | 1,596 | 0.190 | | 0.198 | |
| 288,000 | 1,915 | 0.237 | | 0.244 | |
| 312,000 | 2,075 | 0.270 | | 0.283 | |
| 336,000 | 2,234 | 0.305 | | 0.318 | |
| 360,000 | 2,394 | 0.340 | 1 | 0.349 | |
| 384,000 | 2,554 | 0.377 | | 0.387 | |
| 408,000 | 2,713 | 0.414 | | 0.420 | |
| 432,000 | 2,873 | 0.456 | | 0.473 | |
| 456,000 | 3,032 | 0.503 | | 0.520 | |
| 480,000 | 3,192 | 0.554 | | 0.574 | |
| 504,000 | 3,352 | 0.592 | 0.013 | 0.629 | |
| 512,000 | 3,405 ⁽²⁾ | 0.630 | 0.025 | 0.649 | (3) |

 ⁽¹⁾ FROM FRACTURE SURFACE MEASUREMENT, ALSO a ≈ 0.02 → 0.025 THROUGH MOST OF THE SPECIMEN THICKNESS
 (2) NO. OF SPECTRUM REPETITIONS = 1.4
 (3) NO CRACK VISIBLE

TABLE C-31
SPECTRUM BS6.MISC6 TEST CRACK GROWTH DATA
SPECIMEN D10

| CYCLES | FLICHT | | CRACK LENGTH (IN.) AT HOLE A | | NGTH (IN.) OLE B |
|---------|----------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|
| | FLIGHT HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | ^{(а} в ⁾ оѕн |
| 0 | 0 | 0.029 | | 0.030 | |
| 18,000 | 255 | 0.044 | | 0.044 | |
| 36,000 | 509 | 0.062 | | 0.059 | |
| 54,000 | 764 | 0.082 | | 0.079 | |
| 72,000 | 1,018 | 0.106 | | 0.099 | |
| 90,400 | 1,278 | 0.128 | | 0.122 | |
| 108,000 | 1,527 | 0.153 | | 0.145 | |
| 127,200 | 1,799 | 0.180 | | 0.173 | |
| 144,000 | 2,036 | 0.207 | | 0.199 | |
| 162,000 | 2,291 | 0.236 | | 0.224 | |
| 180,000 | 2,545 | 0.266 | | 0.256 | |
| 198,000 | 2,800 | 0.299 | | 0.287 | |
| 216,000 | 3,054 | 0.332 | | 0.319 | |
| 234,000 | 3,309 | 0.370 | | 0.355 | |
| 252,000 | 3,563 | 0.410 | | 0.391 | |
| 270,000 | 3,818 | 0.453 | | 0.435 | |
| 288,000 | 4,072 | 0.497 | | 0.477 | |
| 306,000 | 4,327 | 0.546 | | 0.522 | |
| 324,000 | 4,581 | 0.598 | | 0.570 | |
| 342,000 | 4,836 | 0.648 | | 0.623 | |
| 360,000 | 5,090 | 0.705 | | 0.676 | 0.007 |
| 378,000 | 5,345 | 0.767 | 0.022 | 0.736 | 0.057 |
| 397,600 | 5,622 | 0.852 | 0.152 | 0.817 | 0.166 |
| 414,000 | 5,854 | 0.939 | 0.256 | 0.900 | 0.262 |
| 433,200 | 6,125 | 1.052 | 0.387 | 1.016 | 0.389 |
| 440,000 | 6,222 ⁽¹⁾ | 1.105 | 0.441 | 1.066 | 0.442 |

⁽¹⁾ NO. OF SPECTRUM REPETITIONS = 2.5

TABLE C-32 SPECTRUM BS6.COMB3 TEST CRACK GROWTH DATA SPECIMEN D11

| | | CRACK LENGTH (IN.) AT HOLE A | | CRACK LENGTH (IN.) AT HOLE B | |
|---------|----------------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|
| CYCLES | FLIGHT HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | ^{(а} в ⁾ оѕн |
| 0 | 0 | 0.010 ⁽¹⁾ | | 0.035 | |
| 18,000 | 145 | 0.015 | | 0.053 | |
| 36,000 | 289 | 0.026 | | 0.073 | |
| 54,000 | 434 | 0.040 | | 0.093 | |
| 72,000 | 578 | 0.055 | | 0.114 | |
| 90,400 | 726 | 0.068 | | 0.139 | |
| 108,000 | 867 | 0.086 | | 0.166 | |
| 127,200 | 1,021 | 0.105 | | 0.194 | |
| 144,000 | 1,156 | 0.124 | | 0.228 | |
| 162,000 | 1,301 | 0.144 | | 0.263 | |
| 180,000 | 1,445 | 0.166 | | 0.296 | |
| 198,000 | 1,590 | 0.187 | | 0.334 | |
| 216,000 | 1,734 | 0.213 | | 0.378 | |
| 234,000 | 1,879 | 0.238 | | 0.421 | |
| 252,000 | 2,024 | 0.269 | | 0.472 | |
| 270,000 | 2,168 | 0.295 | | 0.530 | 0.074 |
| 288,000 | 2,313 | 0.332 | | 0.600 | 0.165 |
| 306,000 | 2,457 | 0.369 | | 0.692 | 0.264 |
| 324,000 | 2,602 | 0.410 | | 0.795 | 0.372 |
| 342,000 | 2,746 | 0.453 | 0.037 | 0.922 | 0.505 |
| 360,000 | 2,891 | 0.496 | 0.086 | 1.071 | 0.660 |
| 378,000 | 3,035 | 0.542 | 0.130 | 1.236 | 0.827 |
| 394,327 | 3,166 ⁽²⁾ | 0.587 | 0.172 | 1.404 | 1.007 |

⁽¹⁾ FROM FRACTURE SURFACE MEASUREMENT, a = 0 MIDPOINT THROUGH THICKNESS AND ON THE OTHER SIDE OF SPECIMEN (2) NO. OF SPECTRUM REPETITIONS = 1.3

TABLE C-33 SPECTRUM BS6.COMB6 TEST CRACK GROWTH DATA SPECIMEN D20

| | 5110117 | | ENGTH (IN.) OLE A | CRACK LEN AT HO | |
|---------|----------------------|--------------------------------|----------------------|--------------------------------|----------------------------------|
| CYCLES | FLIGHT HOURS | (a _A) _i | (a _A)osh | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.017 | | 0.024 | |
| 24,000 | 193 | 0.020 | | 0.034 | |
| 49,280 | 396 | 0.030 | | 0.044 | |
| 72,000 | 578 | 0.037 | | 0.049 | |
| 96,000 | 771 | 0.045 | | 0.060 | |
| 120,000 | 964 | 0.054 | | 0.073 | |
| 144,000 | 1,156 | 0.065 | | 0.085 | |
| 168,000 | 1,349 | 0.075 | | 0.099 | |
| 192,000 | 1,542 | 0.083 | | 0.112 | |
| 216,000 | 1,734 | 0.093 | | 0.127 | |
| 264,000 | 2,120 | 0.113 | | 0.154 | |
| 312,000 | 2,505 | 0.139 | | 0.185 | |
| 360,000 | 2,891 | 0.163 | | 0.217 | |
| 408,000 | 3,276 | 0.192 | | 0.256 | |
| 432,000 | 3,469 | 0.207 | | 0.272 | |
| 456,000 | 3,662 | 0.222 | | 0.300 | |
| 480,000 | 3,854 | 0.243 | | 0.327 | |
| 504,320 | 4,050 | 0.263 | | 0.354 | |
| 552,000 | 4,433 | 0.299 | | 0.408 | |
| 578,400 | 4,645 | 0.326 | | 0.439 | |
| 600,000 | 4,818 | 0.344 | | 0.470 | |
| 624,000 | 5,011 | 0.370 | 1 | 0.505 | |
| 648,000 | 5,203 | 0.398 | | 0.544 | |
| 696,000 | 5,589 | 0.460 | | 0.625 | |
| 720,000 | 5,782 | 0.498 | | 0.671 | |
| 744,000 | 5,974 | 0.533 | | 0.723 | |
| 768,000 | 6,167 | 0.575 | | 0.778 | |
| 792,000 | 6,360 | 0.622 | | 0.840 | |
| 816,000 | 6,552 | 0.668 | | 0.903 | |
| 840,000 | 6,745 | 0.714 | | 0.965 | |
| 864,000 | 6,938 | 0.766 | 0.022 | 1.040 | 0.050 |
| 888,000 | 7,131 | 0.824 | 0.062 | 1.125 | 0.112 |
| 912,000 | 7,323 | 0.889 | 0.145 | 1.215 | 0.231 |
| 936,000 | 7,516 | 0.956 | 0.229 | 1.313 | 0.329 |
| 960,000 | 7,709 ⁽¹⁾ | 1.055 | 0.333 | 1.450 | 0.459 |

⁽¹⁾ NO. OF SPECTRUM REPETITIONS = 3.1

TABLE C-34 SPECTRUM BS6.COMB11 TEST CRACK GROWTH DATA SPECIMEN D21

| | FLIGHT | | ENGTH (IN.) OLE A | CRACK LET | |
|------------------------|-----------------------|--------------------------------|----------------------------------|---|----------------------------------|
| CYCLES | HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i 0.025 ⁽¹⁾ 0.025 0.032 0.038 0.039 0.041 0.045 0.048 0.054 0.063 0.064 0.071 0.078 0.088 0.102 0.113 0.121 0.131 0.141 0.155 0.164 0.179 0.191 0.202 | (a _B) _{OSH} |
| 0 | 0 | 0.024 | | 0.025 ⁽¹⁾ | |
| 24,000 | 371 | 0.027 | | | |
| 49,280 | 761 | 0.030 | | 0.032 | |
| 72,000 | 1,112 | 0.032 | | 0.038 | |
| 96,000 | 1,483 | 0.033 | | 0.039 | |
| 120,000 | 1,854 | 0.037 | | 0.041 | |
| 144,000 | 2,225 | 0.039 | | 0.045 | |
| 168,000 | 2,596 | 0.045 | | 0.048 | |
| 192,000 | 2,966 | 0.049 | | 0.054 | |
| 216,000 | 3,337 | 0.052 | | 0.063 | |
| 264,000 | 4,079 | 0.057 | | 0.064 | |
| 312,000 | 4,820 | 0.062 | | 0.071 | |
| 360,000 ⁽²⁾ | 5,562 | 0.069 | | 0.078 | |
| 408,000 | 6,304 | 0.080 | | 0.088 | |
| 456,000 | 7,045 | 0.085 | | 0.102 | |
| 504,320 | 7,792 | 0.097 | | 0.113 | |
| 552,000 | 8,528 | 0.104 | | 0.121 | |
| 600,000 | 9,270 | 0.113 | | 0.131 | |
| 648,000 | 10,012 | 0.122 | | 0.141 | |
| 696,000 | 10,753 | 0.134 | | 0.155 | |
| 744,000 | 11,495 | 0.146 | | 0.164 | |
| 792,000 | 12,236 | 0.159 | | 0.179 | |
| 840,000 | 12,978 | 0.170 | | | |
| 888,000 | 13,720 | 0.179 | | | |
| 936,000 ⁽³⁾ | 14,461 | 0.188 | | 0.213 | |
| 960,000 | 14,832 | 0.225 | | 0.252 | |
| 984,000 | 15,203 | 0.237 | | 0.263 | |
| 1,008,000 | 15,574 | 0.247 | | 0.276 | |
| 1,057,920 | 16,345 | 0.287 | 0.035 | 0.320 | 0.050 |
| 1,104,000 | 17,057 | 0.327 | 0.068 | 0.364 | 0.101 |
| 1,152,000 | 17,798 ⁽⁴⁾ | 0.372 | 0.136 | 0.408 | 0.141 |

⁽¹⁾ FROM FRACTURE SURFACE MEASUREMENT, a_o = 0 ON THE OTHER SIDE OF SPECIMEN

⁽²⁾ STARTING WITH CYCLE 360,001, FOR 50 CYCLES, ALL LOADS WERE INADVERTENTLY INCREASED BY 8890 PSI
(3) ALL LOADS INCREASED 35 PERCENT BECAUSE OF VERY SLOW CRACK GROWTH

TABLE C-35
SPECTRUM BS6.COMB12 TEST CRACK GROWTH DATA SPECIMEN D23

| | FLICHT | | ENGTH (IN.) OLE A | CRACK LE AT H | NGTH (IN.) DLE B |
|---------|----------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|
| CYCLES | F LIGHT HOURS | (a _A) _i | (a _A) _{OSH} | (a _B) _i | (a _B) _{OSH} |
| 0 | 0 | 0.015 | | 0.031 | |
| 20,000 | 161 | 0.023 | | 0.042 | |
| 42,480 | 341 | 0.034 | | 0.057 | |
| 60,000 | 482 | 0.044 | | 0.068 | |
| 80,000 | 642 | 0.059 | | 0.082 | |
| 100,000 | 803 | 0.074 | | 0.102 | |
| 120,000 | 964 | 0.086 | | 0.113 | |
| 140,000 | 1,124 | 0.104 | | 0.133 | |
| 160,000 | 1,285 | 0.118 | | 0.153 | |
| 180,000 | 1,445 | 0.136 | | 0.170 | |
| 200,000 | 1,606 | 0.154 | | 0.191 | |
| 220,000 | 1,767 | 0.170 | | 0.211 | |
| 240,000 | 1,927 | 0.189 | | 0.234 | |
| 260,000 | 2,088 | 0.211 | | 0.263 | |
| 280,000 | 2,248 | 0.232 | | 0.286 | |
| 300,000 | 2,409 | 0.257 | | 0.312 | |
| 320,000 | 2,570 | 0.281 | | 0.340 | |
| 340,000 | 2,730 | 0.304 | | 0.366 | |
| 360,000 | 2,891 | 0.330 | | 0.400 | |
| 380,000 | 3,051 | 0.360 | | 0.436 | |
| 400,000 | 3,212 | 0.388 | | 0.466 | |
| 420,000 | 3,373 | 0.422 | | 0.507 | |
| 440,000 | 3,533 | 0.456 | | 0.546 | |
| 460,000 | 3,694 | 0.495 | | 0.591 | |
| 480,000 | 3,854 | 0.534 | | 0.636 | |
| 500,000 | 4,015 | 0.576 | | 0.689 | 0.017 |
| 520,000 | 4,176 | 0.613 | | 0.738 | 0.030 |
| 540,000 | 4,336 | 0.669 | | 0.817 | 0.070 |
| 560,000 | 4,497 | 0.724 | 0.041 | 0.900 | 0.221 |
| 580,000 | 4,657 | 0.780 | 0.092 | 0.986 | 0.326 |
| 600,000 | 4,818 | 0.849 | 0.142 | 1.093 | 0.436 |
| 621,840 | 4,993 | 0.934 | 0.187 | 1.232 | 0.575 |
| 640,000 | 5.139 | 1.015 | 0.290 | 1.369 | 0.712 |
| 644,000 | 5,171 ⁽¹⁾ | 1.032 | 0.312 | 1.395 | 0.733 |

SUSTAINED COMPRESSION LOADING (SCL) EFFECT TEST CRACK GROWTH DATA SPECIMENS F1 THROUGH F5 TABLE C-36

| | | | CRACK | LENGTH | (IN.) AT | RACK LENGTH (IN.) AT HOLE A OR B OR EDGE C | R B OR | EDGE C | | | | | |
|---------|--------|-------------------|-----------------------|---------------------|-------------------|--|-------------------|-------------------|-----------------------|-------------------|-----------------------|-------------------|-----------------------|
| | | | SPE | SPECTRUM F WITH SCL | WITH S | CL | | | S | PECTRUM | SPECTRUM F, NO SCL | | |
| | FIGURE | S | SPECIMEN F1 | F1 | | F2 | | | F3 | | F4 | | F5 |
| CYCLES | HOURS | (a _A) | (a _B) (1) | (a _C) | (a _A) | (a _B) (1) | (A _C) | (a _A) | (a _B) (1) | (a _A) | (a _B) (1) | (a _C) | (a _B) (1) |
| 0 | 0 | 0.160 | 0.140 | 0.264 | 960.0 | 0.140(2) | 0.048 | 0.104 | 0.140 | 0.074 | 0.140 ⁽²⁾ | 0.060 | 0.140 ⁽²⁾ |
| 10,956 | 400 | 0.166 | 0.152 | 0.281 | 0.103 | 0.153 | 0.048 | 0.109 | 0.153 | 0.084 | 0.150 | 0.063 | 0.150 |
| 16,790 | 613 | 0.171 | 0.157 | 0.286 | 0.108 | 0.159 | 0.048 | (3) | (3) | (3) | (3) | (3) | (3) |
| 21,912 | 800 | (3) | (3) | (3) | (3) | (3) | (3) | 0.123 | 0.163 | 0.094 | 0.157 | 0.064 | 0.158 |
| 32,868 | 1200 | 0.182 | 0.166 | 0.291 | 0.120 | 0.172 | 0.052 | 0.132 | 0.173 | 0.103 | 0.162 | 990'0 | 0.166 |
| 43,824 | 1600 | 0.194 | 0.171 | 0.336 | 0.132 | 0.183 | 0.052 | 0.140 | 0.186 | 0.109 | 0.169 | 0.068 | 0.174 |
| 54,780 | 2000 | (3) | (3) | (3) | (3) | (3) | (3) | 0.151 | 0.197 | 0.123 | 0.177 | 0.070 | 0.185 |
| 65,736 | 2400 | 0.213 | 0.189 | 0.380 | 0.148 | 0.208 | 0.054 | 0.163 | 0.211 | 0.136 | 0.184 | 0.075 | 0.192 |
| 76,692 | 2800 | 0.219 | 0.196 | 0.407 | 0.151 | 0.219 | 0.055 | 0.175 | 0.227 | 0.148 | 0.193 | 0.079 | 0.204 |
| 87,648 | 3200 | 0.235 | 0.205 | 0.436 | 0.172 | 0.233 | 0.057 | 0.185 | 0.242 | 0.165 | 0.200 | 0.083 | 0.214 |
| 98,604 | 3600 | 0.247 | 0.219 | 0.471 | 0.180 | 0.246 | 0.057 | 0.201 | 0.257 | 0.177 | 0.213 | 0.088 | 0.225 |
| 109,560 | 4000 | 0.255 | 0.232 | 0.515 | 0.193 | 0.262 | 090.0 | 0.216 | 0.272 | 0.192 | 0.224 | 0.093 | 0.243 |

(1) FASTENER IN HOLE: NET FIT (0.0001 →0.0002 IN. CLEARANCE) TITANIUM HILOK, NO HEAD NOR NUT

⁽²⁾ FROM FRACTURE SURFACE MEASUREMENT THE CRACK LENGTH OF THE OTHER SIDE OF THE SPECIMEN, a₀: F2 (0.190), F4 (0.100), F5 (0.10) (3) NO MEASUREMENT MADE